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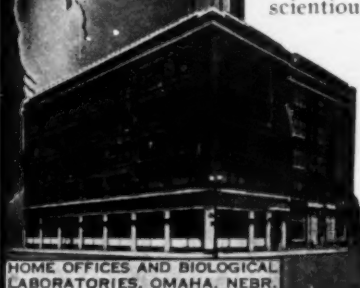
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Crotalaria Spectabilis Poisoning in Louisiana Livestock

P. L. PIERCY, D.V.M., and L. L. RUSOFF, Ph.D.

Baton Rouge, Louisiana

CERTAIN SPECIES of *Crotalaria* have become justly popularized as valuable legumes in some sections of Louisiana, two of the more important species being *Crotalaria spectabilis* Roth and *Crotalaria intermedia* Kotschy. Information secured on *C. spectabilis* (see, fig. 1), grown under Louisiana conditions through 1943-1944, has established its toxicity for cattle and chickens and has given sufficient evidence to support its recommendation for use as a leguminous cover crop only in areas not grazed by livestock. Cattle losses sustained on one Louisiana tung tree plantation in 1943 and 1944, of which approximately two thirds of the acreage had been seeded with *C. spectabilis* and one third with *C. intermedia*, were shown, by field and experimental findings, to be due to the toxicity of *C. spectabilis*.

LITERATURE REVIEW

Crotalaria poisoning has been variously reported, the literature being capably and thoroughly reviewed by Ritchey, *et al.*¹ An early report of poisoning in horses by *Crotalaria sagittalis* Linn was made in 1884 by Bessey,² and six years later Greshoff³ reported the isolation of a toxic alkaloid from *Crotalaria retusa* L. seeds. Subsequently *Crotalaria juncea* L. seeds were shown to be toxic for sheep,⁴ *Crotalaria Burkeana* Benth for cattle,^{5,6} and *Crotalaria dura* Wood and Evans for horses.⁷ More recently, extensive work in Florida¹ with various species of *Crotalaria* has proved the toxicity of *C. spectabilis* for cattle, horses, swine, and poultry and of *C. retusa* for chickens. Symptomatic and autopsy findings in animals

with *C. spectabilis* poisoning have been reported in detail.^{8-12, 1, 13, 14.}

The Florida workers¹ found that *Crotalaria* was low in palatability to cattle as compared with good grasses. *C. intermedia* was reasonably palatable and had additional good qualities in the feeding studies which were conducted. No toxic properties could be demonstrated for it; however, all parts of *C. spectabilis* plants were found to be poisonous to livestock. Fortunately though, it is definitely low in palatability, being grazed and eaten only when more desirable forage is not available. Under natural field conditions, *C. spectabilis* poisoning was of a chronic nature, the poisonous principle being assimilated slowly and accumulated in the body to produce clinical poisoning at a much later date. Symptoms of poisoning often did not appear until two to five months following the eating of the plant.

LOUISIANA FIELD OBSERVATIONS

By invitation of Dr. M. H. Gandy, practicing veterinarian, Baton Rouge, La., the authors accompanied him to the tung tree plantation of the Natalbany Realty Company, near Pine Grove, La., on May 4, 1944, to observe a sick cow and to assist in investigating the cause of cattle losses. Dr. Gandy had previously been called to the plantation to attend similarly affected cattle in December, 1943, and January, March, and April, 1944. Symptoms and lesions found by him in each instance were the same and suggested some type of poisoning. Each case terminated fatally.

In the past, the tung tree orchards had been seeded with *C. spectabilis* and *C. intermedia* because of the excellent qualities of these two plants as leguminous cover crops. In close proximity to the area where

From the Departments of Veterinary Science and Dairy Research, Louisiana Agricultural Experiment Station, Louisiana State University, Baton Rouge.

Associate veterinarian (Piercy) and associate dairy nutritionist (Rusoff).

cattle losses were being sustained, about 1,500 acres had been seeded with *C. spectabilis* and in a more distant area, 700 acres had been seeded with *C. intermedia*. Over a period of time *C. spectabilis* seeds had been remotely scattered to other areas of the plantation, and young plants of this species were found growing voluntarily in limited numbers outside the originally planted sections. Evidence that the cattle had eaten the seeds and had been partly responsible for scattering them was manifested by the observation that some seeds had passed undigested through the animals and were germinating and growing in numerous, remotely isolated piles of droppings.

The sick cow observed on May 4, a grade Hereford, about 6 years of age and in good condition, had calved a few days previously. She was first noted to be sick about fifteen hours before our arrival, and when first observed by us was lying down unable to rise. She exhibited nervousness, kept her feet and legs in slight motion, and was salivating profusely. She was destroyed for postmortem examination which revealed a thickened abomasal wall that was infiltrated with clear, gelatinous material, a greatly enlarged gall bladder, and strikingly bright hemorrhagic areas on the heart ranging in size from petechiae to ecchymoses. The lesions were characteristic of *Crotalaria* poisoning but were less prominent and less extensive than when the poisoning is permitted to kill the animal by its own effects. These findings and the history of the previous losses on the plantation all suggested that type of toxicity.

The authors again visited the plantation on Aug. 16, 1944, for the purpose of obtaining a supply of *C. spectabilis* plants for feeding to experimental animals. Upon arrival it was learned that a cow had died about six hours previously, and an autopsy was made to determine the cause of death. The foreman stated that more than 40 cattle had died up to that date in 1944, and that all had appeared to be affected similarly to the first one observed by Dr. Gandy and the authors. The carcass of the cow, on this date, was in good state of flesh. The teats and ocular areas were cyanotic in appearance at that time, and tarlike feces had been passed. The animal had been sick about twenty-four hours before dying, showing symptoms similar to previous cases during the clinical period.

Autopsy study revealed extensive petechial and ecchymotic hemorrhages subcutaneously. Upon opening the abdominal cavity, strikingly bright submembranous hemorrhagic areas were found to exist extensively in most organs. Fatty deposits were unique in appearance with numerous hemorrhages present. The liver was slightly enlarged and marked by profuse petechiation; the gall bladder was markedly enlarged (see, fig. 2) and of striking appearance, with hemorrhages of varying sizes in its walls. The abomasal wall was thickened by a clear gelatinous infiltration. A few hemorrhagic areas could be noted on the spleen, especially in the marginal regions of the organ. A clear, gelatinous deposit was present in the abdominal cavity. In the thoracic cavity, the heart was found to show prominent hemorrhages of bright appearance and petechial to many times larger in size. The entire picture presented was that of a complete breakdown of the blood vascular system by virtue of which nearly all the body tissues were brightly marked by irregular and often coalescent hemorrhagic spots of various sizes (see, fig. 3).

EXPERIMENTAL FEEDING

Cattle.—A supply of *C. spectabilis* plants was secured at the plantation on August 16, and returned to Louisiana State University where it was allowed to dry as hay for experimental feeding which was started Sept. 5, 1944. When gathered the plant was in the blooming stage with small numbers of immature seed pods. The experimental animal used in this feeding trial was Jersey steer 234954 which weighed 526 lb. on September 5. The animal was healthy and in good condition. While weight records were not continued after that date, the animal appeared to lose flesh during the periods he received *C. spectabilis* hay, fed at the rate of 10 lb. daily, as his only source of nutrition. This feeding period was terminated when this lot of hay was exhausted at the end of ten days. Physical abnormalities were not observed during the period.

A second lot of the *C. spectabilis* hay was given from October 11 through October 19, at the rate of 10 lb. daily. The plants this time contained few blooms and many immature seed pods. The third feeding trial was made with more mature plants that contained many seed pods in various stages

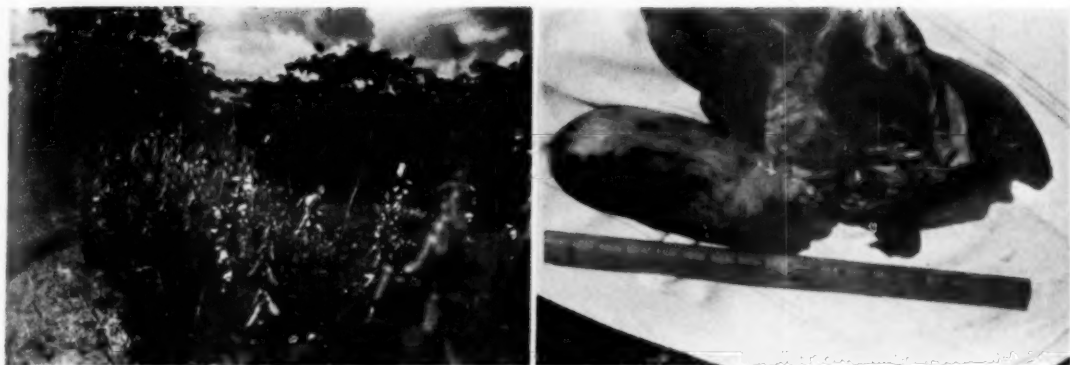


Fig. 1—*Crotalaria spectabilis* in blooming and early pod stages of development, growing in a tung tree orchard on the Natalbany Realty Company Plantation near Pine Grove, La.

Fig. 2—Liver and greatly distended gall bladder from a cow poisoned by *Crotalaria spectabilis* while grazing. This gall bladder was aspirated and found to contain 800 cc. of bile; the walls were marked by numerous hemorrhagic areas.

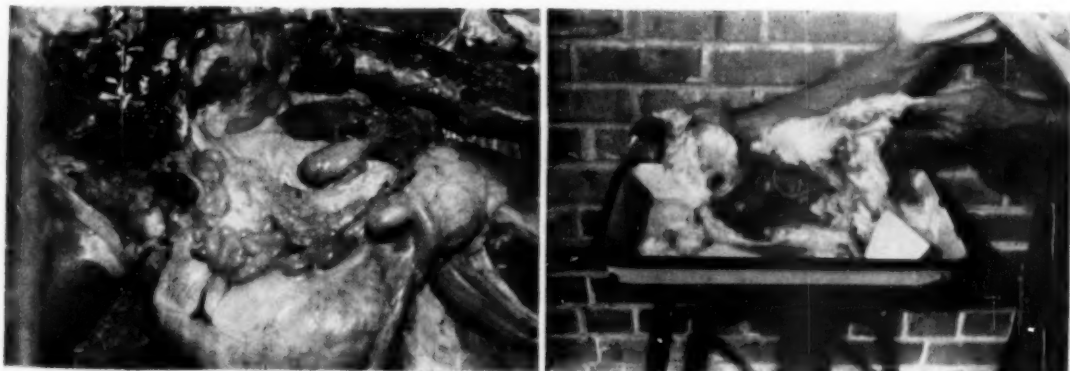


Fig. 3—A profuse hemorrhagic condition is found in cattle which have died from *Crotalaria spectabilis* poisoning. Hemorrhages are bright in appearance and vary in size according to the degree of coalescence which has taken place.

Fig. 4—Hemorrhagic findings in chickens poisoned by *Crotalaria spectabilis* are similar in appearance and occurrence to those found in cattle.





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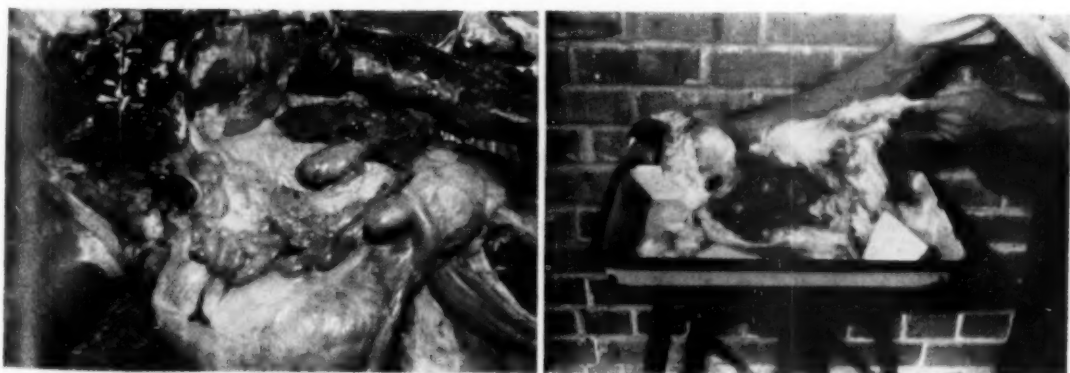


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Fig. 4—Hemorrhagic findings in chickens poisoned by *Crotalaria spectabilis* are similar in appearance and occurrence to those found in cattle.



of maturity, from November 1 through November 10.

In all feeding-trial periods, the steer ate the leafy portion quite readily as well as most of the stemmy portion of the plants. Seed pods were least appetizing to him, apparently due to low palatability or their extremely fibrous character or both. Between feeding-trial periods the animal was permitted to graze at will on pasture.

The first abnormalities were shown by the steer on November 20, when he exhibited slight weakness and a mild degree of anorexia. By December 10, these symptoms were more marked, though not extreme, and in addition, slight incoordination while walking could be noted. The symptoms were not sufficiently prominent to be alarming or probably to be noticed by casual observers. Some of the seeds were recovered from pods which had been ignored by the animal during the feeding trials and 117 Gm. of them given to him in capsules on December 5.

The slowness with which toxicity from *C. spectabilis* develops was well demonstrated by the fact that definitely marked symptoms were not observed until Jan. 10, 1945, a period of 112 days following the start of the first feeding trial, and thirty-six days following the administration of the seeds. This substantiates the findings of other workers who report a chronic, cumulative type of toxicity for *C. spectabilis*.

On Jan. 10, 1945, at 8:00 a.m., the steer showed complete loss of appetite, extreme restlessness, weakness, and nervousness. By 4:00 p.m., he was down, unable to rise, with feet and legs in slight walking-like movement and was salivating profusely. By 4:45 p.m., death had occurred and an autopsy was performed. Lesions identical to those found in carcasses examined at the tung tree plantation near Pine Grove were observed in the steer, being well marked and extensive throughout most body tissues and organs.

Poultry.—Chickens used in one series of studies were hens of comparable size and breed. One experiment in which 2 of them were used involved the isolated toxic principle of the plant, an alkaloid known as monocrotaline. It was isolated from all portions of the young, immature plants obtained at the Pine Grove plantation on August 16. After dissolving the alkaloid in physiological salt solution, it was injected into a hen intravenously. By the same pro-

cedure, a second hen was used for control purposes by being inoculated with a similar solution of monocrotaline which had been isolated by the junior author while in Florida and which had proved toxic in Florida studies.

Both hens showed moderate physical depression one hour following injection. At the end of four hours the combs were becoming markedly cyanotic, and vomiting-like movements were noted. At this time, there was complete loss of appetite. Both hens died within thirty-six hours, and autopsy examinations were made with similar pathological findings. The chief external change to be noted was the prominent cyanosis of the combs. Internal lesions included strikingly bright hemorrhages of varying sizes (see, fig. 4) in fatty deposits, heart, liver, lungs, gizzard, and crop, especially just beneath the serous membrane coverings. The ovaries were highly congested, and the gall bladder was notably enlarged. The abdominal cavity contained considerable clear, jelly-like material.

A white leghorn hen was used for a free-choice, feeding trial with *C. spectabilis* seed in varying stages of maturity. She had not undergone starvation before this and began eating the seeds at once, consuming approximately 170 seeds before complete inappetence developed. At the end of twenty-nine hours, her comb was congested, appearing much more deeply reddened than normal. She was dead at the end of forty-eight hours, and autopsy findings were the same as those shown by the 2 hens previously described, which had been injected intravenously with monocrotaline. In addition, a number of undigested seeds were found in the contents of the crop.

A very acute type of the poisoning was demonstrated in 1 hen after it had been injected intravenously with more than four times the lethal dose of monocrotaline. The bird died about seven hours following the injection and before lesions could become widespread. Petechiation could, however, be observed on the heart and gizzard, as well as in abdominal fatty deposits.

Rabbits.—*C. spectabilis* seeds in varying stages of maturity were offered to a white buck rabbit, beginning Oct. 10, 1944, by free-choice feeding procedure. At first he ate the seeds quite readily, but after consuming a relatively small number he completely ignored them. The fact that he could not be induced to eat them after pe-

riods of starvation indicated a very low degree of palatability. No effort was made to force feed the seeds to him at any time.

This rabbit appeared to be in good health until found dead in its cage on Jan. 9, 1945, or ninety-one days after being observed to eat some of the seeds. Postmortem examination revealed that the direct cause of death was pneumonia, but one lesion not attributable to pneumonia was of interest and should be mentioned. This was a relatively large, bright, and coalesced hemorrhagic area beneath the lining membrane of the stomach. It was of similar character to those found in the cattle and chickens herein described.

THE POISONOUS PRINCIPLE

The alkaloid, monocrotaline, as reported in Florida toxicity studies,¹⁵ is the poisonous principle of *C. spectabilis* for live stock. Its formula, $C_{16}H_{23}O_6N$, and structure have been determined.¹⁶ While it can be isolated from all portions of the plant, its highest concentration is found in the seeds. In Louisiana it was found to be present even in immature plants in the flowering and early pod stage. Toxicity from it may be either acute or chronic in nature, depending on amounts assimilated by an animal. Thus, the fatal effects of the toxicity may occur early, at which time lesions may not be extensive, or fatal effects may not occur before four months or more following the grazing of the plants, according to the historical, clinical, and experimental evidences in Louisiana. These features may sometimes be overlooked and make the diagnosis confusing, to the extent that other causes may be blamed for such deaths.

SUMMARY AND CONCLUSIONS

1) *Crotalaria spectabilis*, as grown in Louisiana, was found to be toxic for cattle under both field and experimental conditions. Likewise it proved fatal to chickens under experimental study. Under natural grazing or feeding the plant as hay, the toxicity is of chronic nature with fatal effects being demonstrated after the slow, cumulative assimilation of the toxic principle, weeks or even months following grazing or feeding. Farm animals should not have access to the plant in any form or in any stage of its development.

2) The palatability of *C. spectabilis* as hay was of low degree for an experimental steer and did not compare with that for natural pasture forage. Leaves were quite readily eaten while stalk and pod portions of the plants appeared to have a much lower palatability. However, where pastures containing *C. spectabilis* are over-grazed or lacking in more palatable forage, the plant is eaten, as are numerous other poisonous plants which are often unpalatable, and it is consumed mainly because of the animal's inability to obtain more desirable forage.

3) The poisonous alkaloid, monocrotaline, was isolated from all portions of immature plants in flowering and early pod stages. When injected into chickens, this material acted identically with the poisonous principle which had been isolated in Florida from mature plants. Monocrotaline was most highly concentrated in the seed portions of the plant.

4) The outstanding value of *C. spectabilis* as a leguminous cover crop is recognized. However, the fatal findings described for it make necessary its recommendation only in those areas not grazed by livestock. Only in this way can livestock losses be prevented, since effective medicinal treatment is unknown.

ACKNOWLEDGMENTS

The authors wish to express their appreciation to the following for their assistance and indulgence in making this report possible:

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Pigs should weigh 2.5 lb. at birth, 40 lb. at weaning, and 225 lb. at 6 months.

Annual Results of Tuberculin Testing of Cattle*
Fiscal Years 1917-1945

Fiscal Year	Cattle Tested	No.	Reactors %
1917	20,101	645	3.2
1918	134,143	6,544	4.9
1919	329,878	13,528	4.1
1920	700,670	28,709	4.1
1921	1,366,358	53,768	3.9
1922	2,384,236	82,569	3.5
1923	3,460,849	113,844	3.3
1924	5,312,364	171,559	3.2
1925	7,000,028	214,491	3.1
1926	8,650,780	323,084	3.7
1927	9,700,176	285,361	2.9
1928	11,281,490	262,113	2.3
1929	11,683,720	206,764	1.8
1930	12,845,871	216,932	1.7
1931	13,782,273	203,778	1.5
1932	13,443,557	254,785	1.9
1933	13,073,894	255,096	2.0
1934	15,119,763	232,368	1.5
1935	25,237,532	376,623	1.5
1936	22,918,038	163,496	0.7
1937	13,750,308	94,104	0.7
1938	14,108,871	89,359	0.6
1939	11,186,805	60,338	0.5
1940	12,222,318	56,343	0.46
1941	12,229,499	40,702	0.3
1942	10,983,086	28,008	0.26
1943	9,308,936	17,167	0.18
1944	8,894,466	18,338	0.2
1945	8,105,480	19,534	0.24
Total	279,235,490	3,891,950	1.4

*Prepared by Dr. A. E. Wight, chief of the Tuberculosis Eradication Division of the USDA.

Ketosis in the Hawaiian Islands

J. M. HENDERSHOT, D.V.M., B.S.

MUCH EFFORT has been expended by veterinarians and lay investigators in recent years² in an attempt to further scientific knowledge relative to ketosis of the cow, as attested by considerable literature and a horde of hypotheses as to the contributing cause of the condition. In general, it may be stated that the majority of research workers have leaned strongly to the hypothesis that ketosis is a complication of parturition or milk production. If we accept this basis as fact, ketosis then may be considered as an occupational disease of the dairy animal. That the condition is not limited to dairy cattle and occurs as frequently in the steer as in the cow and also in cattle kept under range condition is attested by the frequent appearance of the malady in range herds kept in certain areas on the island of Molokai. A feature of these pasture areas is that the only available forage for cattle is the Kiawe bean (*Prosopis juliflora*) which grows to the exclusion of all pasture grasses along the leeward coastal plain. The bean is abundant during that time of the year when other forage has been exhausted.

The cattle affected are grade Herefords of good quality and of all ages and sexes. A conservative estimate of the animals showing clinical evidence of ketosis is 1 per cent of the total in the area.

Symptomatically, all clinical types of ketosis have been seen during the four years that the condition has been under investigation by this department.

Pathologically, all cases appear to be similar in gross and histopathological changes in that they are constantly found to be in the liver. A contrast arises when autopsy findings of fatal cases in dairy animals are compared with those found in the animals on Molokai. In the writer's experience, the liver changes found in fatal ketosis of dairy cattle are those of diffuse toxic necrosis while in the Molokai cattle the lesions are those of atrophic cirrhosis. What relationship exists between the two

is debatable unless, as we suspect, cirrhosis is a later form or a degree of liver change which varies with a contributing cause yet to be ascertained.

It was thought at one time, and as yet is not discredited, that the vitamin A hypothesis might be operative in these cases. Kiawe beans have been found by nutritionists of the University of Hawaii to assay 125 I. U. of vitamin A per pound of dry weight.¹

With this evidence, affected cattle placed in corrals and tested for nyctalopia all showed remarkably good night vision. Specimens were taken from autopsies for histopathological study for the keratinization coincident in the various epithelial structures involved in vitamin A deficiencies. No pathological changes indicating such deficiency could be found. Simultaneously, liver specimens obtained and analyzed by the Carr-Price method for the quantitative determination of liver carotene were within normal limits. This evidence does not appear to incriminate a vitamin A deficiency or a low intake of the vitamin, unless we may hypothesize a decreased change of carotene to vitamin A.

From the clinical viewpoint, ketosis assumes three principal syndromes, classified as digestive, nervous, and paralytic. These, in our cases, are often viewed as a combination of two of the above classes with an occasional animal showing all three. This leads one to conjecture the possibility that ketosis may be typed as uncomplicated and complicated.

That some credence may be placed on this has been borne out by the cases of 12 of the animals studied in our investigation. This group presented all the classical symptoms plus extreme nervousness and anorexia and, in addition to a positive Ross test, were concurrently affected by an extreme degree of acidosis.

To determine, if possible, the relationship of the acidosis to the over-all symptomatology, 2 steers were selected for further study and treatment. Both were cachectic and nervous and had neither appetite nor sign of rumenatory activity. The feces were

The author is chief of the Department of Bacteriology and Pathology, Board of Commissioners of Agriculture and Forestry.

scanty, dry, and blackish and were evacuated at infrequent intervals.

Each animal was given sodium bicarbonate by stomach tube. In addition, 1 received 500 cc. of 50 per cent glucose in Ringer's solution, intravenously, and the other received 1,000,000 I. U. of vitamin A. Response in the form of restored digestive function and appetite was established in both after the second day, at which time the urine and blood were found negative for signs of acidosis; sodium bicarbonate therapy was then discontinued. The other treatments were continued for five days, and daily analysis was made of the blood sugar levels, which ran within normal limits for the steer receiving the glucose but fell sharply to 17.6 mg. per cent in the vitamin A-treated steer, at which point the animal was found comatose and was destroyed. Autopsy revealed the condition of the liver as previously described. However, some marked differences were apparent in the digestive tract, compared to our former observations.

In this steer, the rumen was about three-fourths full, and the contents were semiliquid. All parts posterior contained their normal amount of contents, in contrast to autopsies on untreated animals where the rumen alone contained elements of food.

The remaining steer made immediate gains in appetite, flesh, and tractability. Blood sugars were determined daily over a forty-day period. Fluctuations with a low of 29.0 mg. per cent on the ninth day, when additional glucose was given, were in evidence until the seventeenth day when a steady rise continued until the twenty-seventh day and a high of 73.5 mg. per cent was reached after which the curve flattened and continued in excess of 70.0 mg. per cent for the next thirteen days.

The steer's recovery then being apparent, he was sent to pasture.

This does not, of course, discredit the vitamin A hypothesis, although it does appear that other factors may be causative and the rôle of vitamin A deficiency as the factor subject to question in our cases.

A recent paper by Shaw, Matterson, Surgenor, and Hourigan² suggests that ketosis may be the result of impairment of the function of the liver in its glycogenic and glycolytic capacity. We feel that this is a significant part of ketosis. Evidence of this has been more or less borne out in

our cases. It has been our custom to compile all facts which may be pertinent to the establishment of a working hypothesis from the clinical evidence and clinical pathology of our cases. Specimens from the livers of the majority of our autopsies have been examined microscopically for liver glycogen without finding evidence that glycogen as such was present. Lapsing back to the hypothesis that ketosis is in some manner related to carbohydrate and lipid metabolism or catabolism, as the case may be, the functional capacity of the liver seems to be a promising subject for investigation.

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Wartime Progress of Veterinary Medicine in Demolished Countries

The arrival of wartime journals from Continental Europe, after five years of postal blockade, reveals that neither the science nor the use of veterinary medicine stopped during the Nazi nightmare. In addition, the coming of stacks of the more familiar foreign language journals imposes the task of gleaning the more significant highlights required to fill the gap with the missing links. The type and amount of veterinary research and clinical reports published in the German, Russian, French, Scandinavian, Italian, and Balkan states from 1939 to 1945 is most astonishing in view of the ordeal the people of these countries experienced during the reign of the gangsters. The juxtaposition of veterinary science to folk welfare is told in the material published in these wartime veterinary magazines. The improvement of foot-and-mouth disease vaccination during the war period can be pointed out as an example of the missing links, along with the keen interest in reproductive troubles, the antibiotic products, the chemical germ killers, Brucella vaccination, the insecticides, and the sulfonamides. Even as the bombs were dropping and the armies advancing, the publishing of veterinary magazines was not stopped.

The World Livestock Situation and the War

J. E. SHILLINGER, D.S., M.S., D.V.M.

Washington, D.C.

Throughout the world, in normal times, livestock enjoys a more uniform rate of production than many other forms of agriculture. The fluctuations of animal populations usually respond slowly to supportive or depressive influence. Human need of animal products is generally anticipated by the respective countries sufficiently in advance to provide for ordinary requirements.

Some countries are recognized as being approximately on a production-consumption basis while most areas depend in varying degrees on either imports or exports. Those countries accustomed to exporting livestock or animal products have generally enjoyed a reasonably stable market in the consuming countries and hence could plan their production accordingly. In the scheme of operations during peace times, some groups of people did not have available all of the milk, meat, wool, and leather they could use to advantage although there was no dire want.

The misfortunes of war precipitated such violent disruptions of production and commerce in many areas as to seriously affect the needs of whole countries or entire continents. Particularly hard hit were such countries as the United Kingdom, whose people had accustomed their lives and activities to the liberal use of commodities of animal sources. Commendable efforts have been made to provide substitutes in the

form of vegetable proteins for food and synthetic compounds for replacing leather and wool. For most purposes, however, the original natural animal products have superior qualities and will be in demand as soon as they can be made available.

The "scorching" processes conducted by enemies during occupation have not only removed many of the meat and dairy animals but have also destroyed shelters, fencing, and feed. Combined with these factors is the loss of draft animals needed for farming operations and transportation. Only a part of this loss can be replaced by tractors and other motorized equipment. The character of the land and type of farming practiced requires draft animals.

ANIMAL POPULATIONS

Livestock numbers in all of the war theaters have suffered losses. In a few places such as Denmark, the cattle populations have been held at approximately prewar levels. But even in these countries where the enemy overlords chose to maintain ample dairy and beef supplies for their own benefit, the horse, pig, sheep, and poultry numbers were reduced for local consumption or were removed for use by the "Superior Race."

Examples of how subjugated areas have suffered in loss of livestock may be seen in the following figures:

In Greece the reductions have been:

	Per cent
Horses	50
Cattle (all)	40
Pigs	10
Sheep	35
Goats	35
Poultry	10

This report is given by the Balkan Mission, UNRRA, Cairo, Egypt, October 1944, with the comment that "the importance of reestablishing the livestock herds of Greece as soon as practicable is fully recognized, and plans looking toward their replacement and improvement should be put into operation at the earliest opportunity."

Dr. Shillinger, commodity specialist of the Foreign Economic Administration, has purchased a total of 10,300 horses and 300 mules for shipment to the liberated countries. Most of these are mares between 3 and 8 years of age, ranging between 13.3 and 15.1 hands high. He expects to buy an additional 5,000 horses, most of which are already on order.

Six hundred Brown Swiss bred heifers also have been purchased for shipment to the eastern European countries. Brown Swiss were chosen because they supply the need for milk, meat, and draft animals.

An extensive list of veterinary supplies has been prepared, and it is hoped that many of the items enumerated may be secured from American stocks. It is pointed out that supplies going to the five Eastern European countries (Greece, Yugoslavia, Albania, Czechoslovakia, and Poland) are to be paid for by UNRRA, while those going to the remainder of Europe will be paid for by the receiving countries.

In China, the situation does not as yet permit of a clear or complete picture. Information now available does show a decrease in numbers as follows:

	Per cent
Horses	to 48
Cattle	to 59
Water Buffaloes	to 81
Sheep	to 46
Pigs	to 68

With a decrease to these proportions at present, it is difficult to visualize what may be the state of affairs by the time the entire Chinese country is liberated, and their people are permitted to return to peaceful pursuits.

In Yugoslavia true conditions are not known, but cattle and sheep losses are described as being over 30 per cent.

In addition to the losses in numbers of cattle, the per animal production of milk has shown a marked decrease in all warring countries.

POST WAR ADJUSTMENTS

During the early postwar period, it will be possible for countries having good commercial facilities to reestablish through normal trade channels a reasonable flow of animal products for their use. Other countries not so fortunately situated in the commercial sphere, will have to depend primarily upon home production, which can be made possible through a reasonable degree of restocking of other animals from other areas. In some areas, cows are required to serve the dual purpose of furnishing milk and pulling plows and carts, while in other places sheep are utilized as milk producers as well as a source of wool.

The destroyed and confiscated stock should be replaced with animals of identical or similar character. The reasons for this are obvious. Climate, forage, utilization, and customs largely determine the types of animals qualified to meet a country's needs. Experience gained by the inhabitants concerned has illustrated what breeds best serve their purposes. In no event is it recommended that any radical change designed to "improve" the character of livestock in any area be undertaken. The native populations should determine what is wanted.

For example, one could hardly visualize a high-grade, milk-producing Guernsey cow

pulling a plow in Greece or serving as the power plant for irrigating a rice field or cultivating the same in China. Nor would our large Percheron, Belgian, or Clydesdale draft horses be satisfactory on the very small subsistence farms of a few acres in Albania or Yugoslavia. Few people in this country realize the extent to which cattle are used as work stock in Albania, Greece, and China. In these areas, concentrated feeds are very scarce and the animals subsist largely on native forage throughout most of the year with a little stored feed for the more severe winter months. For effective work under these conditions, few of our purebred animals are suitable. Mixed breeds of good muscular development are better qualified.

Horses and mules ranging from 750 lb. to 1,150 lb. in weight are required for draft and transportation purposes as compared with the usual farm draft horse in this country varying from 1,200 lb. to 1,700 lb. in weight. Considerable packing is still carried on in some places and for this work, especially in the hilly countries, mules are preferable to horses.

Following the first introduction of beasts of burden for immediate relief of the impoverished nations, it is expected that a moderate supply of breeding stock will be made available, and that certain improved modifications of local types of livestock may be made gradually, with outside help. These anticipated changes in types of livestock may very properly parallel other changes in agricultural development. Obviously, such improvements must come slowly, and the numbers of breeding animals to be imported would not radically change the situation for some time.

China has need for some of the better grade of dairy cattle for her Western Provinces close to the larger cities. Likewise, her representatives have requested a supply of better types of fine wool sheep, milk goats, and swine. One of the more important work animals in China is the water buffalo, a rugged and effective animal for peculiar types of heavy draft. They are particularly desirable for work in the rice fields. Their strength and docility fit them for the cultivation in the muddy fields needed for rice culture. Losses of great numbers of these to the enemy will call for extensive replacements. The countries from which they are procurable are limited.

It is likely that poultry numbers have been hard hit in all countries. Physical difficulties will preclude extensive shipments of live poultry. It is expected that hatchable eggs can be transported with relatively low losses and the resulting production will furnish a desirable supply of animal protein during the first year.

COMPLICATING FACTORS

In the entire scheme of reestablishing agriculture and industry in the respective war stricken countries, there is no commodity which presents greater complications than livestock. Individual variation in size, age, quality, and suitability requires that each specimen receive careful inspection by the purchasing agent. The mechanics of assembling hundreds of animals from the points of purchase to certain points at shipyards for overseas transportation require a well organized plan to avoid excessive loss. During the time such animals are held and are aboard ship in transit, feed and water must be provided by a corps of attendants. Special ships must be used, of which there is a small number. Purchases must be made in accordance with the availability of these stock boats.

The disease situation presents another serious complicating factor. Only a negative result could follow the delivery of animals carrying virulent infections. Therefore, it is highly important that animals be purchased only from herds free of hog cholera, bovine tuberculosis, anthrax, and similar destructive diseases. For diseases not readily detected in the ordinary method of examination, immunization should be resorted to, not only to protect the animals being moved but also to protect those with which they will be associated at the point of delivery. Certain diseases exist on the European and Asiatic continents which have been completely eliminated from the United States. Stock destined for these places should have protective vaccine administered before they leave our shores.

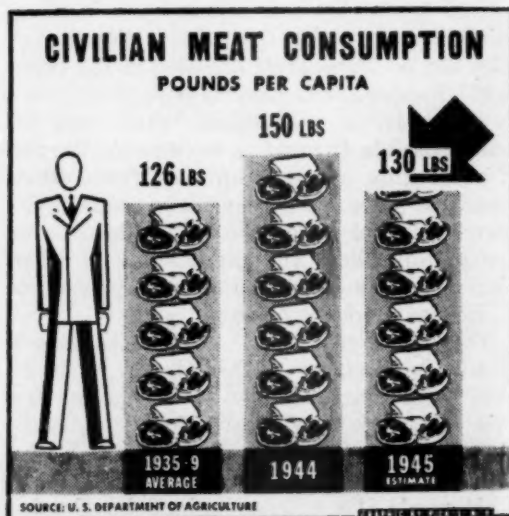
Proper coordination of these activities demands an effective organization of technical and administrative workers, and all should be cognizant of the biological and mechanical factors involved with animal maintenance and transportation. In no event should shipments of stock precede an adequate supply of feed in the country of destination.

It is expected that the United States and Canada will play an active part in supplying the livestock to be shipped to the liberated areas. The limitation of shipping space available funds for purchase, and livestock will determine the extent of these shipments.

Electric Heater for Watering Troughs

An invention of no mean importance is an electric, shock-proof gadget to prevent the water of livestock watering troughs from freezing. It consists of a hollow disk encircled with a heating element in such a way as to keep the current from shocking the drinkers. The current is supplied from the barn's lighting system.

If asked to point out in what respect the veterinary military service has made the most important advance, any old timer would salute: "In having developed a fine spirit of coöperation with the Quartermaster Department." That's the way it looks from here.



This "Graphic by Pick" shows that in prewar times the American (U.S.A.) population, all ages included, consumed 0.345 lb. of meat per day, that the rate increased during the height of the war to 0.401 lb. per day, and then dropped to an estimated 0.356 lb. per day during 1945. The graph shows also that the meat-producing farmers were able to meet the increased demand for meat during the war. Veterinarians participated in the increased production by preventing gain-reducing factors and death losses.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Effects of Stilbestrol in Retained Placenta

G. R. MOORE, B.A., D.V.M., M.S.

Manhattan, Kansas

BECAUSE of my association with the veterinary clinic of Kansas State College, I have had the opportunity to handle the genital disease problems of several dairy herds in which I was able to make repeated examinations of animals that had been treated and to carry on a limited amount of experimentation. The purpose of this paper is to report observations on the therapeutic effects of stilbestrol on suitable cases of bovine retained placenta that were presented for treatment during the period, 1941 to 1945.

REVIEW OF LITERATURE

Dodds and his coworkers¹ in 1938 announced the synthesis of a compound, 4:4'-dihydroxystilbene, and, in view of the fact that it was the mother substance of natural estrogenic agents, suggested the name stilbestrol. They pointed out that the substance could be readily prepared in the laboratory at a reasonable cost, and that it possessed estrogenic properties two or three times as great as natural estrone.

Stilbestrol became available for experimental use in America in 1939 and appeared on the market in 1940. Since that time, much interest has been shown in its clinical uses, and it has been the subject of considerable investigation by many workers.

That stilbestrol has an effect similar to estrone on the mammary glands has been reported by Lewis and Turner.²⁻⁷ In extensive experiments on dry, lactating, and virgin cows and goats they found it capable of stimulating growth of the mammary ducts and, to less extent, of the lobular-alveolar tissue. Prolonged administration in some instances induced lactation in virgin and dry animals but did not consistently augment milk flow in previously lactating animals.

During the last three years, many reports of the clinical uses of diethylstilbestrol have ap-

peared in the literature. Brownlee⁸ presented a theoretical discussion of the inter-relationships between estrogens, progesterone, and the pituitary gland with their effects on the uterus. He called attention to the fact that when estrogens reach a sufficiently high concentration, they cause regression of the corpus luteum and simultaneously sensitize the uterus to the oxytocic principle of the pituitary body. Should the placenta die, estrogenic level necessary to inaugurate the mechanism of birth might never be reached, and the fetus would be retained. The presence of the fetus in the uterus, acting as a deciduoma, maintains the corpus luteum, while the corpus luteum maintains the uterine contents. The logical treatment to break this pathological cycle would be to raise the blood estrogen level to that stage at which the corpus luteum regresses. This can be done, according to the author, by injecting 25 mg. of stilbestrol. Frank and Smith⁹ reported the use of 25-mg. doses of diethylstilbestrol in 2 cases of bovine retained placenta. In each case, the placenta was expelled two days later without further treatment. They stated that the results in these 2 cases warranted further trials of this drug in obstinate cases of retained placenta. They failed to report whether or not they had made a uterine examination to determine the degree of retention before administering the drug.

The *Canadian Journal of Comparative Medicine*¹⁰ reported a case of placental retention following the operative removal of dead twins from a Holstein-Friesian treated with uterine injections of sulfanilamide in mineral oil to guard against sepsis from the decomposing afterbirth. Because of the flaccidity and atonicity of the uterus, 20 mg. of diethylstilbestrol were injected intramuscularly on the first and fourth days. On the fifth day it was possible to remove the membranes completely. It was thought that the drug helped keep the cervix open and furthered the involution of the uterus.

Conn¹¹ reported that in his experience the intramuscular injection of 20 mg. of diethylstilbestrol was far superior to any other method for the treatment of retained placenta in dairy

From the Department of Surgery and Medicine, Kansas State College, Manhattan.

cattle. He stated that in 75 per cent of his cases, results were secured within thirty-six hours. Most cases came in heat, he added, within seventy-two hours. If heat failed to occur within seven days, a second dose was given.

Contradictory observations were reported by Glenney,¹² who found that the drug did not expel the bovine placenta, but that it might be useful supportive therapy in pyometra. He thought that its value in stimulating involution of the uterus following calving was questionable.

Since that time, English veterinarians have used stilbestrol and its derivatives quite extensively in the treatment of anestrus, retention of the fetal membranes, mummified fetus, pyometra, and retention of the corpus luteum. Few of them have included specific data in their reports, most of which are of isolated clinical cases involving many uncontrolled factors. There is still much work to be done before all of the uses of stilbestrol in cattle practice can be properly evaluated.

EFFECTS ON RETAINED PLACENTA

All cows used in this study were clinical cases brought to the Kansas State College Veterinary Hospital by the owner for treatment for retained placenta. All breeds common to this area were represented. They included 3 Holstein-Friesians, 6 Jerseys, 1 Guernsey, 8 Ayrshires, 2 Shorthorns, 10 Herefords, 1 Aberdeen-Angus, and 12 grades. They varied in age from 19 months to 11 years.

Each case was examined on arrival by a competent clinician. A careful manual exploration of the uterus was made and if, in the opinion of the clinician, the placenta was too firmly attached to come away by itself in a reasonable time (48 hours), the case was accepted for the experiment. The condition of the placenta, the degree of retention, and the condition of the cervix and vagina were recorded.

Commercial solutions of stilbestrol in oil were used, and the drug was given intramuscularly in all cases. Single doses varied from 30 to 80 mg. of pure stilbestrol. In some cases, a single dose was given; in others it was repeated from one to three times. In each case, a daily manual examination of the uterus was made, and the findings were recorded. No attempt was made to remove the placenta manually as long as, in the opinion of the clinician, it could be left without endangering the life of the patient. The results of this experiment are recorded in table 1.

RESULTS

Of the 43 cases of bovine retained placenta treated in this experiment 4 appeared to be definitely benefited by the injection of stilbestrol. Although it is not possible to determine this point with accuracy, it was the opinion of the clinician in charge that the loosening of the placenta was more rapid than usual in placentae attached equally firmly. In 8 cases the degree of detachment seemed slightly in excess of that observed in similar untreated cases. These were classified as being questionably benefited by the treatment.

Five cases seemed to be definitely injured by the treatment. Case 14, a valuable purebred Guernsey, became comatose sixty-five hours after the administration of 80 mg. of stilbestrol. She passed into a coma like that of parturient paresis, regained consciousness after receiving 500 cc. of 20 per cent calcium boro-gluconate, and relapsed into coma again within an hour. Repeated treatments with calcium boro-gluconate brought similar results. No type of therapy used gave any benefit, and the cow died about sixty hours after the onset of the symptoms. Autopsy findings were negative except for some passive congestion of one lung. While it is probable that the connection between the symptoms and the stilbestrol administration was coincidental, it is also possible that the drug may have produced an endocrine upset from which recovery was impossible. No reports of similar cases could be found in the literature.

In 4 other cases a rather interesting and undesirable phenomenon occurred. About the time that symptoms of estrus appeared, in twenty-four to seventy hours after treatment began, several of the cows showed some evidence of straining. Examination at this time did not reveal the presence of a vaginitis. Cases 8, 11, 15, and 32 were all mature cows with large, well-relaxed vulvas which allowed the vagina to evert with each straining attempt. Straining was so violent in each case as to produce defecation. As a result, the vaginal mucosa was contaminated every few minutes with fecal material. Three of these cows developed necrotic vaginitis and the fourth an acute catarrhal vaginitis. All 4 cases required protracted treatment. Three recovered eventually, and the fourth, a valuable purebred Holstein-Friesian, developed

a stricture of the vagina, severe enough to interfere seriously with future breeding. She was subsequently sold for slaughter.

Twenty-five of the 43 cases of retained placenta in this experiment appeared to be neither benefited nor injured by the stilbestrol. In 8 cases the placenta eventually came away unaided. In the remaining 35 cases it was necessary to perform manual removal.

DISCUSSION

Retained placenta in the cow is a term used somewhat loosely. All placentae are retained for a short time. In healthy cows, the period from parturition to expulsion is relatively short in most cases. In the present study, cases were observed in which the entire placenta came away unaided within thirty minutes following parturition. In other cases the expulsion occurred spontaneously and without treatment, several days after calving. In still others the placenta remained in the uterus until completely liquefied, then it was discharged slowly over a period of weeks. Between these extremes are found all degrees of retention. Exploration revealed that the placenta was rather firmly and extensively attached in many cases, but it came away unaided a day or two later.

In dairy cows, fetal membranes retained from six to twenty-four hours are the rule rather than the exception. Examination at this time reveals that, in most cases, detachment is extensive and progressive, and that slight manipulation causes the whole mass to drop away. This type of case should not be confused with that in which there is extensive and firm retention with no tendency toward detachment after periods ranging from twenty-four to seventy-two hours following parturition. In the former there are no marked lesions, and the whole process is so unaccompanied by untoward after effects that it must be regarded as essentially physiological. In the latter type, retention is complete and pathological. Williams, Udall, Frost, Cushing, Fincher, and Mobie¹³ and Williams¹⁴ pointed out that this type of retention is due to, and a manifestation of, uterine lesions that existed before parturition. It is this type that makes placental retention a major problem and which requires careful treatment and supervision if the future fertility and even the life of the animal is to be preserved.

Many conflicting reports have appeared in recent years concerning the therapeutic

value of stilbestrol as an aid in the expulsion of retained placentae. Those reporting favorably fail to give the results of a pre-treatment examination, if one were made, or, in most cases, to report the duration of retention before treatment with stilbestrol was begun. Early treatment, without examination, leads to highly optimistic results because it includes so many cases that do not need treatment.

In the cases studied in this report it would appear that stilbestrol had little value as an aid in the expulsion of retained placentae. Of the 43 animals treated only 4 (9.3%) appeared to be benefited, 8 (18.6%) received slight or doubtful benefit from the treatment and 5 (11.6%) seemed to be definitely injured by the treatment. One of the animals in the latter group died, 1 became sterile, and 3 required protracted treatment before recovery ensued.

The straining frequently observed soon after the administration of stilbestrol in these cases is worthy of further study. Since mild irritants are known to produce some aphrodisiac effect, it has often been suggested that estrogens in general produce libido either by sensitizing the vaginal mucosa or by producing a mild irritation. It is possible that the estrogenic effect combined with the irritation from the fluid products of placental decomposition resulted in enough stimulus to inaugurate the straining reflex.

CONCLUSIONS

1) As a result of the observations stated herein, it was concluded that stilbestrol, in the manner used in this experiment, was of little, if any, value as an aid in the expulsion of retained bovine placentae.

2) Stilbestrol may sometimes be definitely harmful in cases of retained placenta.

SUMMARY

1) Forty-three cases of bovine retained placenta were treated with doses of stilbestrol ranging from 30 to 50 mg. Of these 43 animals, 4 were benefited, 9 were questionably benefited, 25 received no benefit, and 5 suffered injurious effects. One of the latter group died, 1 was left sterile, and 3 required protracted treatment before recovery was effected.

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⁸Frank, A. H., and Smith, C. A.: The Use of Diethylstilbestrol for Retained Placenta in the Cow. *J.A.V.M.A.*, 102, (1943): 116-117.

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¹⁰Conn, G. H.: Stilbestrol in Dairy Practice. *North Am. Vet.*, 25, (1944): 349-350.

¹¹Glenney, W. C.: Stilbestrol in Dairy Practice. *North Am. Vet.*, 25, (1944): 91.

¹²Williams, W. L., Udall, D. H., Frost, J. N., Cushing, E. R., Fincher, M. G., and Moble, M. H.: Studies in Genital Disease. *Cornell Vet.*, 14, (1924): 215-274.

¹³Williams, W. L.: A Technic for the Study of Genital Disease by Means of the Fetal Membranes. *Cornell Vet.*, 15, (1925): 255.

saline solution, subcutaneously. The local treatment of the stump included the infiltration of the area with an additional 20,000 units of penicillin, injected with a hypodermic syringe. After this initial dosage, the dog received 20,000 units, intramuscularly, every three hours, day and night.

On July 3, spasms having developed, two 1.5-gr. doses of pentobarbital in 6 cc. of the dextrose solution were given intravenously. The penicillin was mixed with these particular injections. Not being able to eat or drink, the dog was given 200 cc. of normal saline solution, subcutaneously, twice daily.

At 5 p. m., July 3, during a spell of acute spasm, the temperature rose to 106.5 F. but dropped to normal after a dose of pentobarbital was administered. A similar rise in temperature took place July 4.

On July 5, the temperature had gone down to 98 F., and the dog was visibly weaker. Although the same treatment was continued, the dog sank into a state of coma and died at 11:30 a. m., which was seventy-five hours after the first sign of tetanus appeared. The conclusion was that tetanus in dogs does not respond to penicillin therapy in the dosage employed.—*Norman L. Garlick, D.V.M., Button Veterinary Hospital, Tacoma, Wash.*

Tetanus Fails to Respond to Penicillin

A male Poodle, 10 years old, weighing 11 lb., was admitted to the hospital June 30, suffering from an injured foot, supposedly the result of an automobile accident. The foot was in a state of dry gangrene, cold, and without circulation. Examination revealed several strands of rubber strangling the leg in the region of the tarso-metatarsal articulation. The leg was amputated at the line of necrosis, and the stump was treated with sodium hypochlorite and sulfanilamide ointment, 5 per cent.

On July 2, the dog was stricken with typical acute tetanus—stiff body, stilty gait, contracted musculature, and extended head. As the owner abandoned the case at this point, we seized the opportunity to test the merits of penicillin in tetanus, at our own expense. At the first sign of tetanus, 30,000 Oxford units of penicillin in 8 cc. of dextrose (50%) was given intravenously along with 200 cc. of normal

Washing the Site of Surgical Incisions

A rational question to ponder in preparing the skin for a surgical invasion is whether the site is getting cleaned or just messed up to no useful end. Hobday (*The Veterinary Journal*, January, 1926) writing from observation running into the thousands, asserted that no benefit was derived from the usual washings of the unbroken skin beforehand. A dry shave and painting with iodine gave better results than the mill run of scrubbings.

Among the recent inventions is a needleless hypodermic syringe. It squirts a stream so fine and swift that the liquid penetrates the skin without the use of a needle.—*From Science News Letter, Sept. 22, 1945.*

Ablation of the Scent Glands of Skunks

ROBERT K. ENDERS, A.B., Ph.D., and ELEANOR M. PAXSON, A.B.

Swarthmore, Pennsylvania

SKUNKS raised in captivity are usually operated upon to remove scent glands. Although raising skunks for fur has not proved profitable, many inquiries concerning operative technique are received from individuals who are conducting experimental work and from those who wish to exhibit the animals or to disarm a pet. This paper describes an operation that is simple and effective.

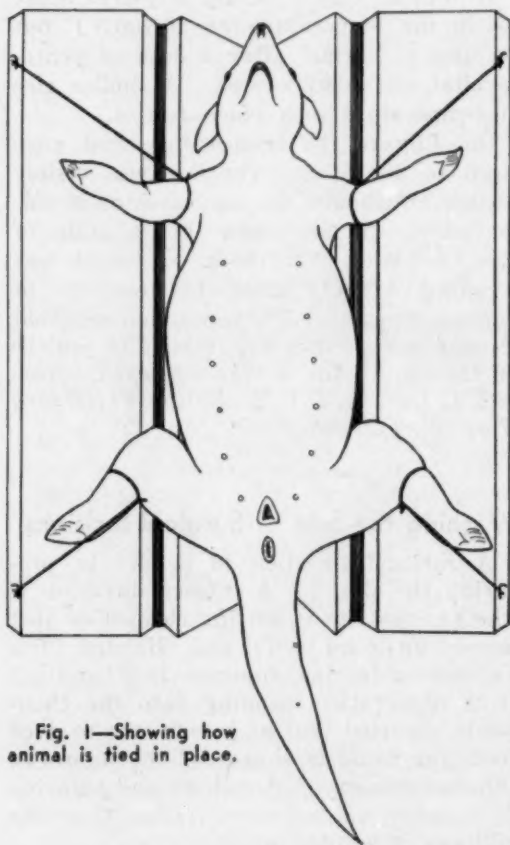


Fig. 1—Showing how animal is tied in place.

Several methods of deodorizing skunks have been described, all of them requiring some skill (Bailey¹, Frick², and Howell³).

From the Fish and Wildlife Service, United States Department of the Interior, and Edward Martin Biological Laboratory, Swarthmore College, Swarthmore, Pa.

The following method, because of its simplicity, has been used with considerable success on old and young animals. Possibly the greatest advantage of this method is that, with care, no odor will be noticeable.

Material and Equipment.—Ether or sodium pentobarbital; three or four artery clamp forceps; small haemostatic forceps; one scalpel or small sharp knife; silk thread, size 30 to 40; aqua ammonia; and operating board.

Anesthesia.—Skunks more than 6 weeks old should be anesthetized. This may be



Fig. 1a—Cross section of operating board showing construction. Note that such an operating board is not necessary.

done with ether or sodium pentobarbital. If a competent assistant is available, ether is simpler, for it is easy to obtain and does not require a hypodermic syringe or exact dosage. To etherize the animal, place it in a sack, and drop the sack in a closed box or pail. As soon as the animal is relaxed remove it from the sack and place it on the operating board (fig. 1). An ether cone may be made by punching holes in the bottom of a mailing tube, packing the bottom lightly with cotton, and pouring ether on the cotton. Do not give too much ether.

Sodium pentobarbital may be used in two ways: If given hypodermically, inject it at the rate of 0.6 cc. per kilogram of body weight, intraperitoneally or intravenously. Mutelids are slow to recover from doses of sodium pentobarbital sufficiently large to insure complete anesthesia. To hasten recovery, 5 cc. of 50 per cent glucose solution can be injected slowly into a vein after the operation, or 25 cc. of water can be injected *per rectum*. The other method

(Howell³) is to administer 1/6 gr. of sodium pentobarbital per pound of live weight on an empty stomach in milk or other light food. The animal drifts into unconsciousness for about one hour.

Operation.—After the animal is under the anesthetic, place it on its back on the

through its muscular investment. Take a scalpel and cut the muscle fibers, as in figure 6, that surround the neck of the gland, keeping a steady traction on the nipple so as to stretch and outline the gland. If the glistening white gland does not loosen at once, dissect the muscular coat a little more,

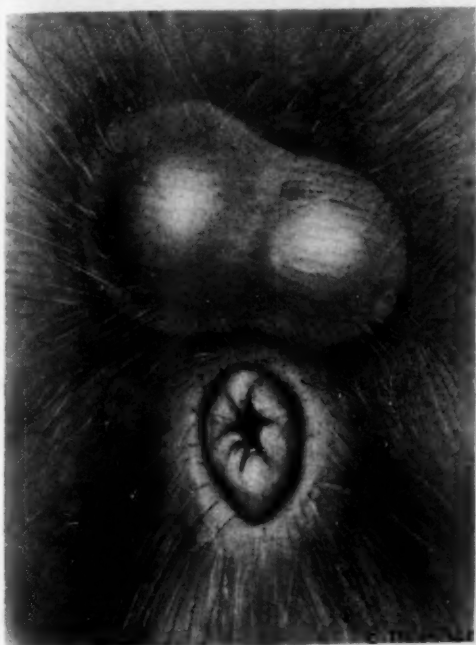


Fig. 2—External genitalia and anus of the male skunk.

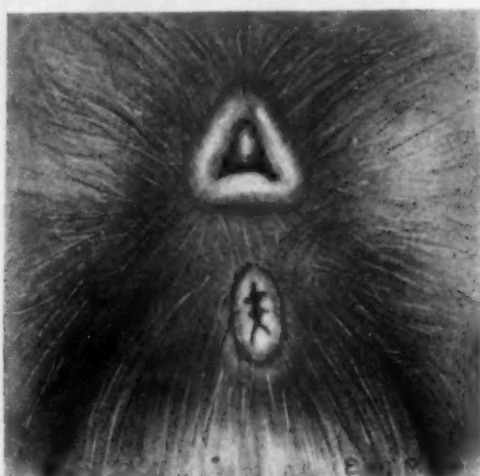


Fig. 3—External genitalia and anus of the female skunk.

operating board and tie down the feet as shown in figure 1. Figure 2 shows the genitalia and anus of the male skunk, and figure 3 shows the female. Both animals were adults in breeding condition; at other times of the year, neither the scrotum nor the vulva are so conspicuous. Place the thumb of the left hand on one side of the anus and the forefinger on the other; then apply slight pressure and traction to make the anus gape. Two nipples will appear, one on each side. Figure 4 shows the topography of the region when the nipples and opening leading to the rectum are exposed.

For the illustration, forceps were used to expose all parts, but this is not necessary in the operation. The small drawing at the upper left of figure 4 shows details of one nipple and the pocket in which it rests.

Now grasp one of the nipples firmly and lock the forceps so none of the contents of the sac can be liberated (fig. 5). Pull gently. The outline of the sac will show

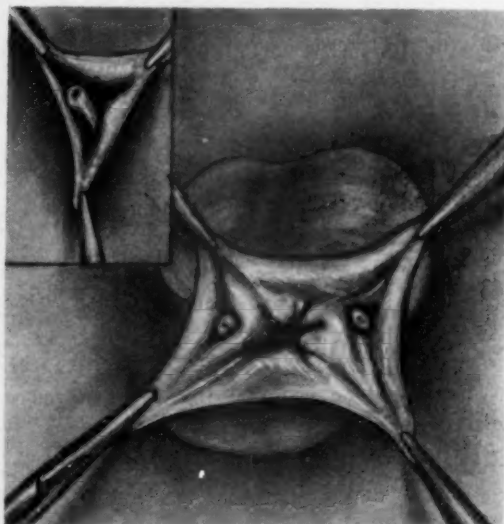


Fig. 4—Topography of region when nipples and opening leading to the rectum are exposed. Insert is of one nipple with the skin retracted.

freeing it all around. Finally, the sac will pull out. If the animal is adult, it is well to tie off below the base of the gland using silk thread and a square knot. Cut the gland above the thread (fig. 7). In young animals, the sac pulls free without

cutting. The gland on the other side is treated the same way. If the work is cleanly done, no antiseptic is necessary.

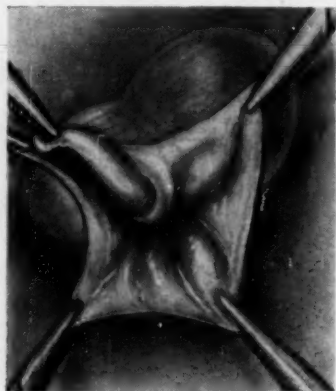


Fig. 5—Manner in which nipples are grasped and the forceps are locked.

A few cautions are necessary. When cutting the muscular wall surrounding the sac, exercise great care, for if the sac ruptures some of its contents will be discharged. Should this happen, apply aqua

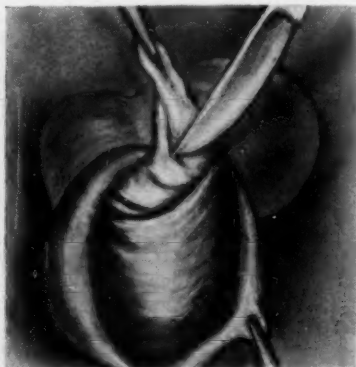


Fig. 6—Manner in which knife is held and used when cutting the muscle fibre.

ammonia to the hands and instruments to remove most of the odor. Always cut with caution for dissection is better. The object is to enlarge the opening at the neck of the scent gland by cutting but to depend on the final separation of the gland from its investing fibers by traction rather than by further cutting. This eliminates much bleeding and makes such a small opening that no stitches are needed. Infection is not likely to follow. Do not use forceps that will cut through the papilla. If the end of the nipple is pinched off by the for-

ceps "musk" will escape; moreover, it is difficult to find the cut end of the nipple, for the nipple will slip back into its crypt,

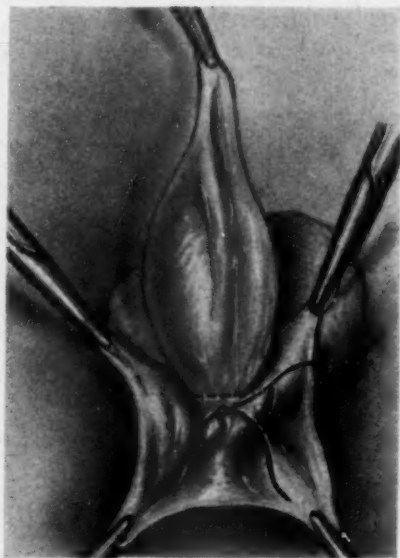


Fig. 7—Sac when pulled out showing knot and place where scent gland is cut.

and blood will obscure the field. No antiseptics are used on the animal but the instruments are sterilized before the operation either by boiling or immersion in alcohol. Normal salt solution can be used to wipe off any blood clots if they form.

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In the castration of colts, protective inoculation against tetanus is as much a part of the operation as making the incision. The operation also furnishes the occasion for conferring lifetime protection against a fatal disease. Every case of tetanus in man or animals nowadays is a sequel to human neglect.

Strict breeding hygiene, the Caslick operation, regular teasing, vaginal examinations, routine use of rat tests, and routine use of hormone products should prove useful in overcoming infertility in horse-breeding establishments.—*Vet. Med.*, Aug., 1945.

CLINICAL DATA

Some Highlights from Recent Meetings

Sixty-second Annual Meeting, Ohio Veterinary Medical Association, Columbus, Jan. 2-4, 1946

Cocker spaniels are likely to eat hairpins, Scotties eat needles, and cats eat string.—*Dr. Gerry B. Schnelle.*

Complete fixation and proper alignment of comminuted fractures are possible with the use of the Stader splint.—*Dr. Otto Stader.*

Disulfalac (Pitman-Moore) which contains sodium thiosulphate, sulfapyridine, and dextrose is effective in treating toxic calves.—*Dr. A. G. Madden.*

Sulfanilamide and penicillin are useful only in controlling secondary invaders in infectious keratitis. They do not control the primary infection.—*Dr. E. M. Baldwin.*

Birds are descended from reptiles and must be medicated as such rather than as mammals.—Astringents and potassium salts are especially helpful in controlling intestinal troubles in poultry.—*Dr. E. S. Weisner.*

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Sixty-second Annual Meeting, Indiana Veterinary Medical Association, Indianapolis, Jan. 9-11, 1946

Proper use of DDT will result in more economical production of meat and milk.—*Dr. A. H. Quin.*

The Indiana State Board of Health should employ a minimum of 100 veterinarians.—*S. E. Burney, M.D.*

The necessity of milking cows twice daily by hand has caused more boys and girls to leave the dairy farms than any other one reason.—*Dr. G. H. Hopson.*

The milk fever victim with high blood pressure is much more likely to recover than the one with low blood pressure. More

milk fever, and of a more severe type, occurs when the weather is humid and the barometer low.—*Dr. S. L. Stewart.*

Traffic in live birds is the greatest source of disease in poultry.—*Dr. F. R. Beaudette.*

The veterinarian has stressed drugs and treatment at the expense of diagnosis. Proper appreciation of the veterinarian will come only following appreciation of the value of accurate diagnosis.—*Dr. G. R. Fowler.*

The use of bacterins for cholera and typhoid vaccination in poultry probably has only a nonspecific protein effect.—*Dr. Elmer Augsburg.*

Manganese deficiency may be a factor in cows that are down but not comatose and which fail to respond to calcium or glucose therapy.—*Dr. B. E. Edgington.*

Cows that fail to get up after milk fever treatment may respond to administration of fluid and Epsom salt through a stomach tube.—*Dr. W. A. Krill.*

In ketosis, starvation upsets the liver function and results in accumulation of ketone bodies in the blood and tissues.—*Dr. George Lies.*

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Forty-sixth Annual Conference of Veterinarians, University of Pennsylvania, Philadelphia, Jan. 8-9, 1946

The faculty, not the bricks and mortar, form the backbone of a veterinary college.—*General R. A. Kelser.*

The best demonstration of Pasteurella infection is fowl cholera.—*Dr. E. L. Stubbs.*

Regular reproduction is a family characteristic in dairy cattle.—*Dr. W. L. Boyd.*

The livestock owner has a right to vaccinate his own stock, but no right to establish new reservoirs of infection.—*Dr. C. P. Bishop.*

Early workers in piroplasmosis thought that the anaplasma was an immature form of the piroplasm.—*Dr. J. C. Lotze.*

The horse is no more susceptible to peritonitis than man so that abdominal surgery may be used to advantage in certain cases.—*Dr. E. A. Churchill.*

No method for reduction or fixation of fractures yet devised is efficient unless the individual applying it is also efficient.—*Dr. E. F. Schroeder.*

Streptomycin offers some hope in the treatment of *Brucella* infection, but is not effective when administered more than two weeks after experimental infection.—*Dr. I. Live.*

During 1945, 35 *Brucella* reactors removed from 26 herds in Pennsylvania also showed lesions of tuberculosis, and 6 were tankers.—*Dr. H. C. Kutz.*

Bleeders (= Cardiac Hemoptysis of Race Horses)

Specialists of the racing circle are familiar with the bleeder—the horse that pulls up with a bloody nose, trailing in with the “also-rans,” though once a creditable performer of his class. There is disagreement as to the cause of the trouble but all concede that a nose bleed after violent exercise in a race horse spells the end of its career, *per se*. The bleeding was not copious enough (in the bleeders we have seen) to be called a hemorrhage. The blood loss is not a factor as in an essential epistaxis of nasal origin. After an hour or less of tranquility in the stall all seems to be normal, in so far as can be detected by the kind of heart or other examination one can make in the field. Some clinical pathologists have concocted the blood flocculation, or colloidal cataclysm, theory without, however, supporting it with investigational work or critical clinical study. Experienced trainers have blamed hasty, in lieu of pa-

tient, training and thus give credence to the cardiac hypothesis. Theoretically, one looks to the great power and clock-like precision of the left heart as the site of the trouble and to long rest, started at once, as the remedy to propose.

Warble Allergy

In the spring, when grubs of *Hypoderma bovis* are being enucleated from the backs of cattle, as is done commonly in dairy cows, the danger of causing grave anaphylactic shock by the apparently harmless intervention method is not to be entirely ignored. The shock corresponds to the degree of sensitization. The second and subsequent seasons of infection are, therefore, more serious than the first season. Dairy cows that have lived through several years of grub infection are that much more vulnerable. Larvicides topically applied is the safer practice.

Moreover, the loss in leather has occupied so much attention that the systemic effects of the migrating larvae are overlooked. These take the form not only of emaciation in heavily infected animals but also invasion of the neural canal when the number of migrating larvae developing cutaneous warbles are few. In Morocco, and also in southern France, where *H. bovis* affects horses, deaths occur from locomotory troubles due to the larvae in the arachnoid space of the lumbar region. Henry, Sergeant, *et al.* (1941) described cases of the same genre in cattle (trembling, decubitus, paralysis) in which autopsies revealed encroachments on the cord.

The U. S. Bureau of Animal Industry has proposed that the restriction of the interstate movement of cattle, on account of reacting to serological tests for brucellosis, be removed in the case of reactors under the age of 18 months that have been vaccinated with strain 19 during their calfhood.

Highest average production comes from dairy cows that are healthy, well bred, and well fed.

Blue back in turkeys is caused by sunshine, not by injury.

Sulfathalidine in the Treatment of Enteric Infections of Small Animals

L. P. HEDEMAN, D.V.M.

East Lansing, Michigan

ENTERITIS with its resulting diarrhea is one of the most common conditions that the small animal practitioner is called upon to treat. The etiologic agents of enteritis are many: foreign bodies (pieces of bone), exposure to cold, severe infection with intestinal parasites, or a complication in infectious diseases. The pathologic condition of the bowel produced by the above agents apparently allows the intestinal bacteria to multiply at the rapid rate manifested by the putrefied feces passed, and the increased indican content of the urine. Various materials have been used in the treatment of enteritis, such as: intestinal astringents, drugs to suppress peristalsis, and so-called intestinal antiseptics (salol, creolin, etc.). These treatments have not been entirely satisfactory. The favorable results reported by Graham *et al.*¹ in the use of sulfathalidine in porcine enteritis suggested a study of sulfathalidine in enteric infections of small animals.

SULFATHALIDINE (PHTHALYLSULFATHIAZOLE)

Sulfathalidine² is obtained from the reaction of phthalic anhydride with sulfathiazole and differs from the other sulfonamides in not having a free amino group on the benzene ring³. Sulfathalidine is sparingly absorbed from the gastrointestinal tract,⁴ therefore under low dosage the intestinal concentration of the drug is high, and the blood concentration is low. For this reason, toxicity at the therapeutic level is practically nil.²

RESULTS

The data presented in table 1 are representative of many clinical cases of enteritis treated with sulfathalidine. In many additional instances, the medication was successfully administered at home, but the

records of these cases were not sufficiently complete to include in this report.

CASE REPORTS

Case 1.—This was a distemper case in which the dog had recovered in all respects except for a profuse diarrhea. After two days of sulfathalidine treatment the diarrhea was checked and the feces were normal.

Cases 2 and 7.—These cases presented the same history and time of recovery. Both dogs had had a severe diarrhea for three days, and the feces were negative for intestinal parasites. After one day of sulfathalidine therapy the feces were normal.

Case 3.—A history of profuse, watery diarrhea for ten days was presented in spite of the owner's treatment with milk of bismuth. A fecal sample revealed many coccidia. Sulfathalidine was administered, and three days later the character of the feces was greatly improved. Bowel passage was absent for three days, and on the fourth day the feces were normal. After eight days of treatment the oöcysts were just as numerous as before treatment, although the feces remained normal.

Cases 4, 5, and 10.—Similar conditions were present in these cases; all animals had diarrhea and frequently vomited for a period of more than one week. Cases 5 and 10 had been under treatment with bismuth subnitrate and astringents during this time, while case 4 had received no treatment. The feces were negative for intestinal parasites. After two days of treatment with sulfathalidine the feces were normal.

Case 6.—This was a severe case of hemorrhagic gastroenteritis. When presented, the dog was passing fetid blood from the rectum, and was unable to support its own weight. The temperature was 97.6 F. One hundred and fifty cc. of 0.85 per cent saline and 10 per cent dextrose solutions were administered intravenously, and sulfathalidine treatment was started at once. The next day, the temperature was 101.6 F.; the diarrhea was not as severe, and the dog ate a small amount of food. The following day bowel movements and appetite were apparently normal.

Cases 8 and 9.—Both of these animals had been going down in condition for several weeks. The feces were dark and fetid but not particularly loose. Fecal examinations revealed no intestinal parasites. Urine tests showed strong positive indican reactions. After twenty-four

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The author is instructor in surgery and medicine, Department of Veterinary Science, Michigan State College, East Lansing.

The sulfathalidine for this study was furnished through the courtesy of Sharp & Dohme, Glenolden, Pa.

hours of sulfathalidine treatment the appetite had improved; in three days the feces were normal in color and odor and the indican content of the urine was normal.

Case 11.—Case 11 had had a persistent diarrhea for some time. Fecal examination was positive for hookworms. The cat was treated with tetrachlorethylene and was given sulfathalidine. After seven days of treatment, the feces were normal. It was believed that sulfathalidine did not shorten the recovery period in this case.

Cases 12 and 14.—A similar picture was presented in these two cases. Both had been sick for two days with vomiting, diarrhea, and lack of appetite. After twenty-four hours of sulfathalidine treatment, the temperature dropped to normal, and the condition of feces improved in each case. In seventy-two hours both animals made complete recoveries.

Case 13.—This cat was in a comatose condition when presented for treatment. The white blood cell count was 350. In spite of the very grave prognosis, sulfathalidine treatment was started. After twenty-four hours of treatment, the cat was somewhat improved and drank three ounces of milk. The temperature dropped

to 104F., from 105.8F. The response was only temporary, however, and the cat died within twenty-four hours.

Case 15.—This case was similar to case 11, except that the feces returned to normal twenty-four hours after hookworm treatment, and it was thought that sulfathalidine may have shortened the recovery period in this case.

It will be noted in table 1, that treatment was continued in most cases for a day or two after apparent recovery. It is thought that sulfathalidine is effective in the treatment of enteritis by combating excessive bacterial proliferation in the bowel and thus decreasing the intestinal irritation.

SUMMARY

Ten cases of canine enteritis responded in from one to five days to sulfathalidine therapy. Sulfathalidine was administered in doses of approximately 1 gr. or more per pound of body weight daily. Sulfathalidine, when administered for eight days, was not effective in destroying or controlling the number of oöcysts in 1 case of

TABLE 1—The Results of Treatment of 10 Canine and 5 Feline Cases of Enteritis with Sulfathalidine

Sulfathalidine												Results
Case	Breed	Age	Sex	Body Wt. (lb.)	Diagnosis	Temperature (F.)	Diet During Treatment	Amt. per Day	Doses Daily	Days for recovery	Died	
1.	Cocker	8 mo.	M	16	Enteritis	102	Meat 50% Dry dog food 50%	18 gr.	4	4	2 days.	
2.	Cocker	4 mo.	F	13	Enteritis	101	Same	15 gr.	4	1	1 day.	
3.	Cocker	18 mo.	M	23	Coccidiosis	101	Same	30 gr.	4	8	8 days.	
4.	Cocker	18 mo.	M	30	Gastro-enteritis	101.5	Same	30 gr.	4	4	2 days.	
5.	English Setter	9 mo.	F	40	Enteritis	101	Same	45 gr.	4	4	2 days.	
6.	English Setter	5 yr.	F	45	Hemorrhagic gastro-enteritis	97.6 to 101.6	Same	60 gr.	4	3	3 days.	
7.	Springer	6 mo.	F	40	Enteritis	104	Same	60 gr.	4	2	1 day.	
8.	French Bull	3 yr.	F	18	Enteritis (chronic)	101	Same	30 1st. 15 2nd.	4	4	4 days.	
9.	Brittany Spaniel	2 yr.	M	40	Enteritis (chronic)	101.4	Same	60 gr.	4	5	5 days	
10.	Springer	4 yr.	F	40	Enteritis	100	Same	45 gr.	4	4	2 days.	
11.	Cat	1 yr.	M	5	Enteritis helminthiasis	102.8 to 101	Meat 50% Dry dog food 50% Milk	7.5 gr.	4	7	7 days.	
12.	Cat	1 yr.	M	6	Enteritis	104.8	Meat 50% Dry dog food 50% Milk	15 gr. 24 hr. then 7	4	4	3 days.	
13.	Cat	4 mo.	M	3	Panleukopenia	105.8	Milk	7.5 gr.	4	2	died.	
14.	Cat	3 mo.	F	3	Enteritis	106	Milk	7.5 gr.	4	4	3 days.	
15.	Cat	1 yr.	M	7	Enteritis	103	Milk	7 gr.	4	3	2 days.	

canine coccidiosis, but the diarrhea which had been present for ten days previously disappeared within three days.

Four cases of feline enteritis (not panleukopenia) responded in one to seven days to sulfathalidine therapy. One case of panleukopenia responded temporarily but did not survive.

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³Scheidt, S. F., Sharp & Dohme, Inc.: Personal communication.
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The Stalk Fields

The "stalk fields" furnish the poorest quality of stock feed that farm animals receive in this country for, when corn has ripened ears its leaves have lost most of their nutritive value and the ears scattered about are soon consumed—often too soon. As feed for milk cows, the stalk fields rate around zero. Horses are left hard to recondition in the spring. The late W. H. Welch, of McLean County, Illinois, thought "way back when" that the stalk fields should be listed among the causes of periodic ophthalmia. Current research confirms the nutritional theory of that malady.

White Scours and Vitamin A

The content of vitamin A in the colostrum strongly influences the incidence of colibacillosis of calves. The vitamin is absorbed with the ingested feed and stored in the liver during the period of mammary rest. The amount stored declines with the duration of lactation and in the colostrum the decline is rapid during the two or three days following parturition. For the calf to have sufficient vitamin A at its disposition it is necessary for it to absorb colostrum, which then protects it against coli organisms.—*Minett, in Jahresbericht*, 67, (1940): 123. *Abstr. Rec. de Méd. Vét.*, 121, (Aug., 1945): 246.

Clinical Notes

Pullets should be kept separate from old hens to reduce disease losses and to increase profits.

The transmissibility of fowl leucosis by an elusive, specific virus has been known for about forty years, contrary to impressions that that knowledge is of more recent origin.

The respiratory rate per minute for colts is 10 to 12; for adult horses, 9 to 10; adult cattle, 12 to 15; sheep, 12 to 18; hogs, 13 to 15; and dogs, 14 to 20.

Unterberger's theory that sex is controlled by the pH of the vagina, discussed at length in *Dog Research Progress* for June, 1945, appears to show that the law of averages has not been revoked.

The life of an animal suffering from anaplasmosis can be prolonged and even saved by good care and dosing with sodium cacodylate and dextrose but recovered animals may become carriers of the specific organism. The mortality ranges from 30 to 50 per cent.—*Animal Pathology Exchange, University of Illinois*.

The purity standard of potable water, of the U. S. Public Health Service, is a coli count of six or less organisms per pint. A coli count up to 100,000 per pint is the range within which water may be made potable by chemical treatment and filtration. Above that count, water cannot be made fit to drink or bathe in, and obviously is unfit for livestock.

Under date of March 8, 1926, Dr. Alexander Anglesey, of Kaluga, Russia, wrote (*The North Am. Vet.*, May, 1926, p. 12): "The tendency of the American agriculturalists to trespass in the realm of veterinary science, foreign to them, is very unpleasant and dangerous because the veterinary branch is no less complex than the agricultural one."

Broilers should be marketed between 8 and 12 weeks.

Treatment of Interdigital Phlegmon ("Foul Claw") with Sulfasuxidine and Sulfathalidine

HAROLD F. NEWTON, D.V.M.

Missoula, Montana

Sulfasuxidine (succinylsulfathiazole) and sulfathalidine (pthalylsulfathiazole) are two of the more recent additions to the sulfonamide group of drugs. They are both relatively unabsorbable from the intestinal tract, and for this reason they have proved effective in the treatment of certain enteric infections. According to pharmacologic studies, about 5 per cent of the amount of these compounds ingested is absorbed, and excreted in the urine.

In the intestine, both drugs undergo hydrolysis in which small amounts of free sulfathiazole are liberated. Their bacteriostatic action is due to this gradual release of sulfathiazole in the intestinal fluids but also, apparently, in part to some other property of the unhydrolyzed succinylsulfathiazole or other derivatives such as acetyl sulfathiazole. In support of this, it has been shown that sulfasuxidine is active against certain intestinal bacteria in man, including some streptococci and staphylococci species not affected by sulfathiazole alone. Experiments have shown that plasma and other wound fluids slowly break down succinylsulfathiazole into free sulfathiazole, presumably in much the same manner as do the intestinal fluids.

Topical use of these drugs is relatively new, and as far as veterinary medicine is concerned, is still in the experimental stage. In human medicine, sulfasuxidine has been used successfully in the treatment of war wounds and extensive burns. It has been particularly recommended in the treatment of large absorbing surfaces—extensive burns, large wounds, and the peritoneum—where the use of other sulfonamides might result in excessive and dangerous blood-level concentrations. Up to 25 Gm. have been used on burns involving 20 to 45 per cent of the body surface without

toxic effects or even any appreciable blood-level concentration of sulfathiazole. Such succinylsulfathiazole as might be absorbed is conjugated and so does not break down further in the blood stream but is excreted intact.

Of more significance to veterinarians than the safety factor is the fact that, in the treatment of burns in man, the apparent period of effective bacteriostatic action lasts from four to eight days. In veterinary practice where daily treatments are therapeutically and sometimes economically unsatisfactory, this delayed absorption may prove an advantage in the treatment of several types of local infections. This prolonged period of action would seem to give these drugs a therapeutic advantage over more absorbable sulfonamides in such conditions as abscesses, infected wounds, compound fractures, and in the open reduction of fractures. Indeed, the use of sulfasuxidine in these conditions has been favorably reported by army surgeons.

The use of sulfathalidine as intrauterine medication, in doses of from 20 to 50 Gm., following the removal of retained placenta in cows, has been reported by Dr. W. T. S. Thorp. He states that clinical observations by practitioners indicate good results when used alone or in addition to an oral dose of sulfanilamide or sulfathiazole.

During the past winter, I have used both sulfasuxidine and sulfathalidine as a local application in abscesses, infected wounds, corneal ulcers, metritis, as intrauterine medication following removal of retained placenta, and in the treatment of interdigital phlegmon, the condition known to the layman as "foul claw" or "foul foot." With the possible exception of the latter condition, the number of cases was too few to warrant any definite conclusions. However, in all cases so treated, both drugs showed equally promising results.

Because the condition of interdigital phlegmon varies so greatly in the intensity

Sharp & Dohme, Medical Research Department, furnished the drugs used in the clinical work reported.

of the symptoms and extent of the lesions, it is only fair to state that all cases treated were in an advanced stage with varying degrees of necrosis of the deeper structures of the foot. A total of 10 of these advanced cases was treated—6 with sulfasuxidine and 4 with sulfathalidine.

Treatment in all cases consisted of the surgical removal of as much necrotic tissue as possible, with the goal of good drainage always in mind. After the area had been thoroughly cleaned, the wound was packed with one of the drugs in powdered form. The pack was maintained, where necessary, by a single layer of gauze bandage over the opening of the wound. In line with the findings of Kingman and Stansbury that the use of too much dressing prevents adequate drainage and subsequent healing of necrophorus infections, it is important that only such dressings be used as are necessary to keep the pack in place.

Varying amounts of both drugs up to 30 Gm. were used without observable toxic effects. In all cases, one treatment was sufficient to bring about a relatively quick and uneventful recovery. Clinical observation failed to show any marked difference in the effectiveness of the two agents used.

ACKNOWLEDGMENT

The author thanks Dr. S. F. Sheidy and Mr. C. W. Stevenson, of Sharp & Dohme, for their assistance in furnishing research data.

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Drugs and Vitamins

Polyneuritis, long recognized as the principal pathological lesion of chronic alcoholism and believed to be due to a direct neurotoxic action of alcohol, is now definitely known to be due to the low thiamin intake of the chronic alcoholic, plus the thiamin deficiency associated with the metabolism

of alcohol. While alcoholic polyneuritis is of no importance in animal pathology because animals are not "hard drinkers," there may be some therapeutic significance in the physiological incompatibility of alcohol and vitamin B₁.

These facts may be correlated also to good advantage with the warning of the Council of Pharmacy and Chemistry of the AMA (*J. Am. M. A.*, Sept. 15, 1945) relative to antagonisms between B complex and certain drugs and the danger of over-dosing with vitamins.

Human Brucellosis

A carefully written article on brucellosis by E. G. Hastings (*Hoard's Dairyman*, Nov. 10, 1945) says that the data indicate that, in considering the importance of Brucella organisms to the health of man, attention should first be directed to the goat and sheep type (*melitensis*), second to the swine type (*suis*), and last to the bovine type (*abortus*). Brucella infections of the swine and bovine types are reported as rarely fatal in man. Undulant fever is recognized as an occupational hazard in the swine slaughter industry, but not in the cattle slaughter industry or in dairy manufacturing. The opinion is expressed that today if all brucellosis in cattle ceased to exist, the physicians of Wisconsin, were they to rely on their own experience, would not realize the passing of the disease in cattle.

This article also reproduces in full the statement by the AVMA Committee (1945) on Brucellosis regarding vaccination of adult cattle, which the Committee suggests should be supplied, in writing, to every herd owner who contemplates adult vaccination.

On the other hand, the widespread demand of dairy farmers to have bovine brucellosis declared inconsequential in public health is not well founded. This is shown in another item from the same magazine, which cites two cases in which the courts awarded extensive damages to persons who had contracted undulant fever, presumably from drinking raw milk. It is interesting to note that the defendant in each case was the distributor and not the producer. It has been conclusively shown that undulant fever does not spread from one human being to another, but that it develops as a result of contact with animals or foods of animal origin.

An Outbreak of Pasteurellosis in Wild Ducks

E. R. QUORTRUP, D.V.M., LT. COL. F. B. QUEEN, M.C., and L. J. MEROVKA

Brigham, Utah

A REPORT was received by Merovka that a large number of wild ducks had been found dead on a small lake located about 15 miles southwest of Dimmitt, Castro county, Texas. The area was visited by Merovka and U. S. Game Agent Boone, who found and picked up 307 dead ducks, nearly all mallards and



Fig. 1—Pintail in characteristic postmortem position. Rigor mortis follows immediately after death, and the head often remains in upright position.

pintails. The farmer on whose land the birds were found stated that to the best of his knowledge and belief the birds had all perished on Feb. 27, 1944. Field examination of the birds indicated that they had died at approximately that time. Only 1 sick bird was observed during the field investigation.

The lake on which they were found is a saucer-shaped body of water about 40 acres in area and very shallow. It has no emergent vegetation whatever and apparently no submerged plant growth. The general character of the lake is not indicative of botulism, which furthermore would not be expected at this time of the year. Nor is there

any history of botulism in this area. Twenty-six other dead ducks were found on a small lake of similar character about 10 miles distant from the one on which the 307 ducks were found. Following the preliminary investigation, information was received from E. G. Pope, assistant district agent, U. S. Fish and Wildlife Service, revealing that losses of a similar nature had occurred simultaneously at Hassell Ranch in Lamb county and at Coyote Lake in Bailey county.

Due to the unusual circumstances, poisoning was suspected, and a few ducks were sent to the Wildlife Research Laboratory at Denver, Colo., where toxicological studies were made. Tests made by Mr. Ward for strychnine, arsenic, thallium, cyanide, and zinc phosphide were all negative. Examinations made by Sperry for toxic food items were also negative. Five other ducks were sent to the Bear River Wildlife Disease Research Station at Brigham, Utah, for bacteriological examination. One culture revealed the presence of *Clostridium botulinum* type A. This is, however, not significant or diagnostic, as any migratory bird may harbor botulinus organisms in the alimentary canal and yet remain in perfect health. The lesions observed in the ducks submitted for examination were not indicative of botulism.

Postmortem Lesions.—Due to the fact that the birds had been dead for several days before examination could be made, considerable autolysis had taken place, and pathologic lesions were therefore not too distinct. Marked petechiation or ecchymosis of the epicardium was, however, a constant finding. In some cases, there was also petechiation of the gizzard walls and tracheal tube. The gastric and intestinal mucosa showed considerable evidence of hemorrhage, and blood was observed in the intestinal lumen. All the birds examined were in good condition; some were fat. Smears made from heart blood revealed the presence of a bipolar, gram-negative organism. Based on these findings, a tentative diagnosis of fowl cholera was made.

U. S. Fish and Wildlife Service (Quortrup), Bear River Wildlife Disease Research Station, Brigham, Utah; Chief of Laboratory Service (Queen), Bushnell General Hospital, Brigham, Utah; U. S. Fish and Wildlife Service (Merovka), Regional Supervisor of Law Enforcement, Albuquerque, New Mexico.



Fig. 2—Attitude assumed in death by pintail and green-winged teal ducks as a result of experimental pasteurellosis.

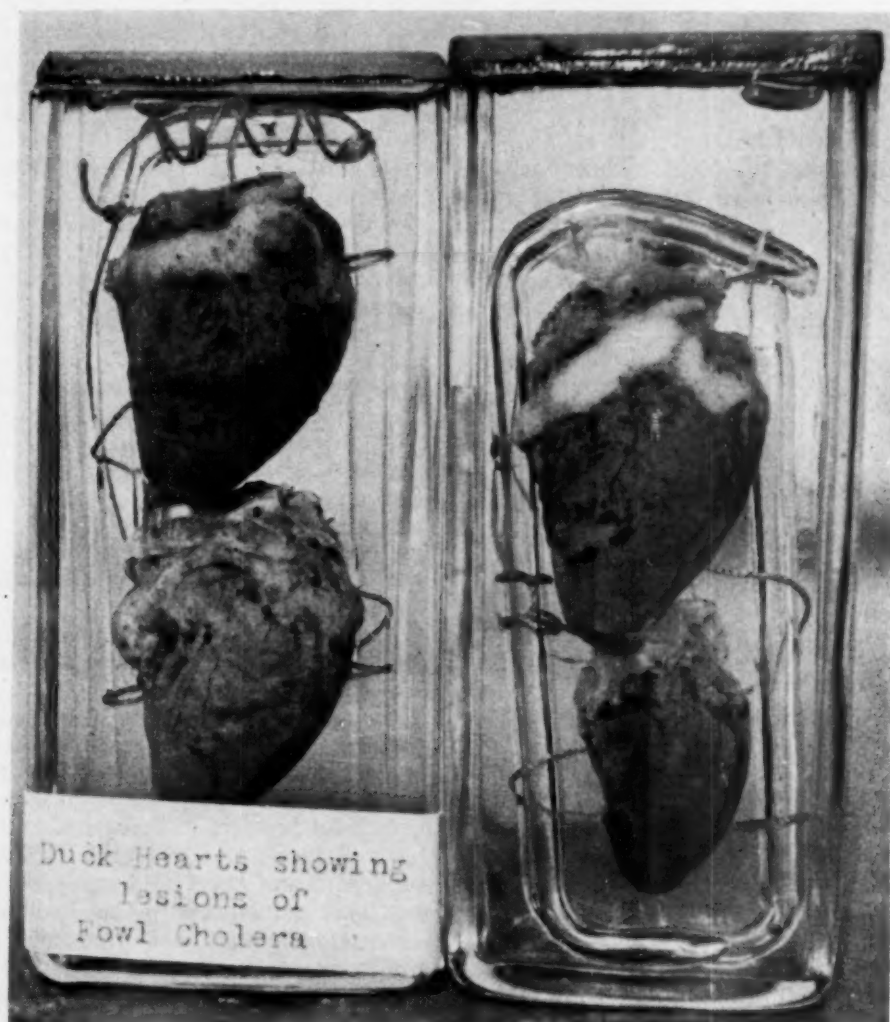


Fig. 3—Characteristic heart lesions of fowl cholera infection in ducks.

References in the literature to fowl cholera in wild birds are none too plentiful, and we have failed to find any papers dealing with specific cases of this disease occurring in wild ducks. Hutyra and Marek¹ state that chickens, ducks, geese, turkeys, pigeons, pheasants, and fancy birds and small wild birds, such as sparrows and finches, are easily infected, and that the disease may be spread by wild birds, particularly sparrows. They also point out that Hertel demonstrated virulent organisms in *Dermanyssus* mites taken from the bodies of sick chickens.

Barger and Card² state that the disease is highly infectious for chickens, geese, turkeys, pigeons, pheasants, and other wild birds, but they give no specific data.

Shillinger and Morley³ state that fowl cholera has been encountered in wild ruffed grouse, and that geese, ducks, turkeys, pheasants, pigeons, quail and a large number of other wild birds are susceptible, but no specific data are given. They mention that the disease in this country is of rare occurrence either on game farms or among wild birds. A personal communication with Shillinger brings out that he observed the disease in domesticated wood ducks on a game farm in the east.

Hinshaw and Emlen⁴ have recently given an excellent account of pasteurellosis occurring in California Valley quail, and Hudson⁵ has given an equally interesting account of fowl cholera in pheasants, but no specific cases involving wild ducks can be found. In view of this and considering that our organism deviates from *Pasteurella multocida* and *Pasteurella avicida* in certain respects, we consider the present paper justified.

Bacteriology.—Pure cultures of an organism apparently belonging to the *Pasteurella* group were isolated from the heart blood of 1 duck on first attempt, and bipolar, gram-negative organisms were observed in smears from all of the ducks. The organism is a small gram-negative rod showing the characteristic bipolar staining of the *Pasteurella* group. It measures from 1.0 to 2.5 μ in length, in blood smears, but in cultures, the organism is only half this size or less. Upon superficial examination, one would indeed classify this organism as a coccus or diplococcus rather than as a *Pasteurella*.

Isolations were made on dextrose starch agar (Difco). Original colonies developing on this medium vary in size from 1.0 to 7.0 mm. in diameter. They are circular and opaque, having a relatively dark center and a lighter periphery. In the early growth they are transparent, later turning opaque like the rest of the colony. The colony is

TABLE I.—Influence of pH on Growth of *Pasteurella Multocida* strain 800 from Wild Ducks

Incubation Time	pH									
	3.8	5.2	6.1	7.0	7.2	7.4	8.0	8.3	8.6	9.0
24 hrs.	0	0	F	E	E	E	E	P	0	0
48 hrs.	0	0	G	E	E	E	E	G	F	P
72 hrs.	0	0	G	E	E	E	E	G	F	F

0=No growth; P=Poor growth; F=Fair growth; G=Good growth; E=Excellent growth.

glistening, convex, grayish-green, fluorescent, and distinctly mucoid, after prolonged growth. On subsequent transfers, colonies tend to become confluent, showing abundant growth on certain mediums, yet failing to grow on others. The most abundant growth is obtained on dextrose starch agar, but good growth is also obtained on proteose peptone hemoglobin agar, cystine heart hemoglobin agar, blood agar, and brain heart infusion. Moderate growth is obtained on proteose peptone agar without the addition of hemoglobin. Poor growth is produced on nitrate agar but is sufficient to show nitrate reduction. The organism fails to grow on nutrient agar, liver infusion agar, tryptone glucose agar, McConkey's agar, SS agar, and Krackes' blood culture medium.

Optimum growth takes place at 37 C., but good growth is obtained at 25 C. and even at 20 C. This appears to be rather odd for a septicemic organism.

Biochemistry.—The organism produces small amounts of indol but no H₂S; nitrates are reduced to nitrites. It is V. P. and M. R. negative and does not grow on citrate medium. A moderate degree of hemolysis is produced on blood agar plates after prolonged growth, but there is no evidence of hemolysis *in vivo*. The organism is aerobic and facultative anaerobic. Catalase is produced, and there is a moderate methylene blue reduction in peptone colloid medium. Ammonia is not produced. Litmus milk remains neutral for eight days, after which it peptonizes completely.

There is no gas production in carbohydrate mediums. Dextrose, mannite, sucrose,

galactose, xylose, arabinose, and mannose are fermented. There is no action on lactose, maltose, adonitol, salicin, inositol, or sorbital; raffinose and rhamnose show a slight acid change after twenty-four hours' incubation but return to neutral after prolonged incubation.

According to Merchant and Rosenbusch,⁶

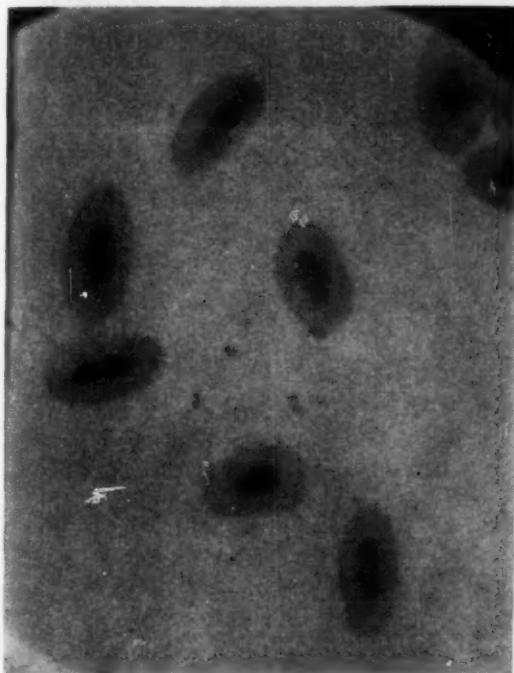


Fig. 4—Blood smear from a duck showing bipolar organisms.

Bergey,⁷ and Topley,⁸ the growth characteristics of *P. multocida*, *Pasteurella pestis*, *Pasteurella tularensis* and *Pasteurella hemolyticus* differ from those of the *Pasteurella* isolated from these five ducks. It will be noted that the carbohydrate reactions of this *Pasteurella* strain check closely with *P. multocida*, but that they differ from this by (1) failing to grow on ordinary mediums, (2) failing to produce H_2S and ammonia, and (3) by producing a moderate degree of hemolysis. These characteristics were considered sufficient by some to justify its classification as a new species. Subcultures were sent to the National Institute of Health, where they were studied by Dr. Elizabeth Verder. Dr. Verder is of the opinion that the cultural differences between our strain and *P. avi-*

cida are not sufficient to justify its classification as a new species. We accept her judgment in this, and regard the strain as a variant of the organism of fowl cholera (*P. avicida*, now called *P. multocida*).

At the time of this writing, the hydrogen ion concentration of the lake where the dead ducks were found is not known, but in order to determine possibilities for natural perpetuation of the organism in western alkaline marshes, the pH range was roughly determined as shown in table 1. It is seen



Fig. 5—Hemorrhage in heart muscle; note separation of muscle bundles and accumulation of erythrocytes in spaces so formed. $\times 100$.

that optimum growth occurs between 7.0 and 7.4, but that the growth range extends from 6.1 to 9.0. What influence the extremes may have on the virulence of the organism has not yet been determined.

Pathogenicity.—Our organism, strain 800, has proved to be highly virulent to all animals on which transmission experiments were conducted.

Mice.—Intraperitoneal, subcutaneous, and intramuscular inoculations of 0.01 to 0.1 cc. of bacterial suspensions (one 24-hour plate

culture washed with 10.0 cc. of saline) kill mice in four to five and one-half hours. Six mice were placed in a box in which Pasteurella cultures had been poured into the drinking water. Five of the 6 mice died

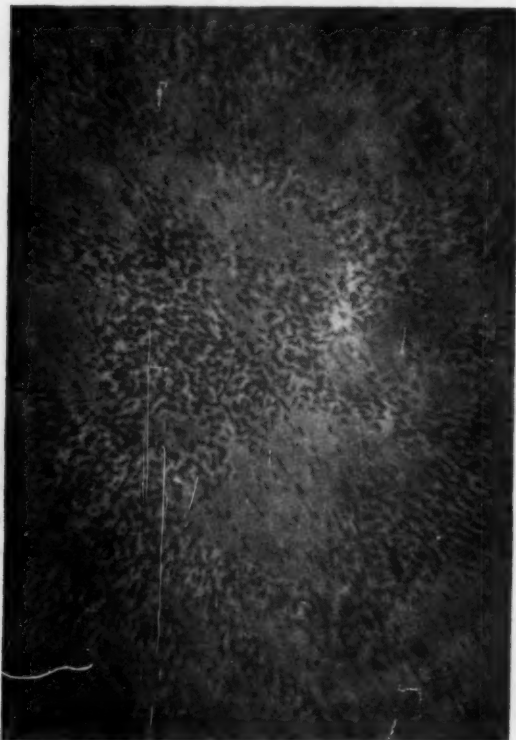


Fig. 6—Appearance of myocardial hemorrhage under higher magnification. x400.

within forty-eight hours. The remaining mouse was destroyed.

Two mice were inoculated with small amounts of the twentieth subculture of our original strain 800 and were placed in a box with 4 healthy mice. The inoculated mice died in a few hours and were left in the cage. Three of the 4 healthy mice died in less than forty-eight hours. The fourth mouse was destroyed.

Hamster.—One hamster was given 0.01 cc., intraperitoneally, and was found dead in less than sixteen hours.

Guinea Pig.—Number 1 was given 1.0 cc. bacterial suspension, intraperitoneally, and was found dead in less than sixteen hours. Number 2 was given 1.0 cc. subcutaneously, and died in twenty-six hours.

Rabbit.—One rabbit was given 1.0 cc., subcutaneously, and died in twelve hours.

Chicken.—Number 1 was given 0.25 cc., intranasally, and was found dead in thirty-four hours. Number 2, one platinum loopful of culture was instilled in the conjunctival sac, and the bird was dead thirty-eight hours later.

Ducks.—Sixteen pintail ducks were used for pathogenicity tests of our organism, revealing that subcutaneous and intramuscular injections invariably resulted in death in from seven and one-half to eight and one-half hours. Bacterial suspensions instilled intranasally or placed in the conjunctivae

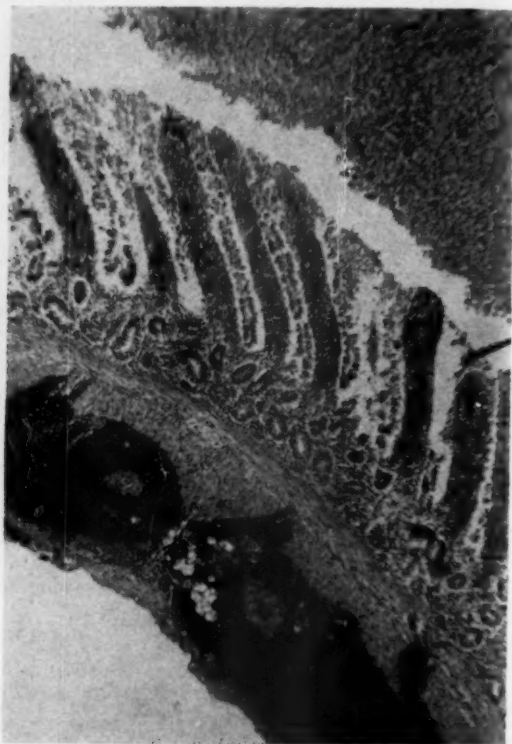


Fig. 7—Subserous and intermuscular hemorrhage of the intestine.

resulted in death in from twelve to twenty hours. Oral administrations were as fatal as intranasal instillations. When normal ducks were placed in cages with ducks which had received oral doses of Pasteurella organisms and had access to the same drinking water, they would die in about twenty-eight hours.

There was no apparent loss of pathogenicity of the organisms after 100 subcultures on starch dextrose agar.

Symptomatology.—The absence of symp-

toms before death is an outstanding feature especially as far as ducks are concerned. A close watch was made for development of symptoms, yet none was observed. The inoculated ducks appeared to be either well or dead. Many birds died with their heads up in a natural sitting position and rigor mortis was immediate.

Some of the ducks, observed ten minutes before death, were apparently in good health except that normal reflexes were not as sensitive as in healthy birds, and they did not become frightened so easily. The temperature of a mallard inoculated with *Pasteurella* was 110.4 F. compared with 107.2 F. of an immune, inoculated bird, and 106.1 F. as the average for three normal ducks.

In chickens, there is a definite disease syndrome exhibited by paleness of comb, drooping wings, tail tilted down for extra support, closing of the eyes, drowsiness, moderate dyspnea, and a general state of ill being. Guinea pigs and rabbits became visibly sick a few hours after inoculation, displaying progressive weakness, dyspnea, and moderate lacrimation. Mice displayed dyspnea and lacrimation. The hamster died during the night and symptoms were not observed.

Immunity.—In the course of testing the potency of various cultures of our organism, strain 800, 1 mallard drake which had been kept in captivity here since September 1943, at which time it was treated for botulism, was found to be immune. It was given several oral, intramuscular, and intraperitoneal doses of the *Pasteurella* organism but failed to develop any symptoms. After inoculations, bipolar organisms could be demonstrated in blood smears stained with Wright's, and normal ducks placed in the cage in which the immune duck was kept readily developed the disease and died. This bird was killed to prevent accidental spread of the disease, after being under observation for five weeks. Autopsy revealed necrosis of the pectoral muscle at the point of inoculation and chronic pericarditis, but there were no typical fowl cholera lesions. Strangely, serum from this duck failed to agglutinate the causative organism either microscopically or in the tube test. This immune duck was able to transmit the disease to healthy ducks caged with it, one week or more following inoculation, infection de-

veloping from virulent organisms apparently being eliminated from the system.

Gross Pathology.—Lesions produced in wild ducks experimentally infected with the organism studied are essentially those pro-

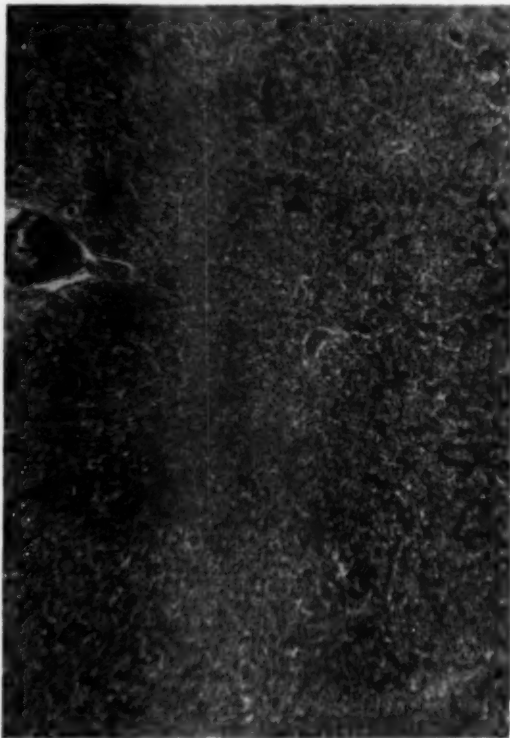


Fig. 8—Focal necrosis in the liver in pasteurellosis in the duck.

duced in fowl cholera. The subcutem may or may not be hemorrhagic. The pectoral muscles often show hemorrhagic areas but may appear perfectly normal. The trachea usually is petechiated. The most constant lesion found is a profuse petechiation or even ecchymosis of the epicardium. Petechiation is often seen on the serous surface of proventriculus, gizzard, and intestine. The intestinal lumen is often filled with blood and hemorrhagic areas may be seen on the mucous membrane. Minute necrotic foci may be seen on the surface of the liver but are not as easily detected as in chickens, due to the darker color of duck livers. As the action of the organism is very rapid, the dead birds are usually fat or at least in good flesh.

Histopathology.—A representative number of sections were made from tissues of

ducks which died following exposure to the fowl cholera organism. Lesions observed were as follows:

Heart.—Erythrocytes occurred in great masses, separating the muscle bundles widely. There was hemorrhage into the pericardial fat but no definite pericarditis. The cells in the myocardium occurred in clusters and irregular groups as well as between the muscle fiber septums. "Polys" were not recognized.

Lungs.—The blood vessels were congested. There was intense congestion so that many of the alveoli were subtotally filled with red cells. Some of the bronchi were similarly hemorrhagic.

Spleen and Pancreas.—Essentially normal.

Liver.—The vessels were congested, in some fields markedly so. The sinusoids exhibited marked congestion. In some areas, there appeared to be hemorrhage into the liver substance. The liver cells were large and pale; nuclei were very pale. A few small areas of necrosis in which there was cell destruction and dense cellular infiltration were found. A few clusters of rod-shaped bacilli were found in the sinusoids.

Intestine.—The mucosa exhibited considerable marked hemorrhage. The lumen contained varying amounts of red cells. There was extensive congestion and hemorrhage between the muscle fibers beneath the serosa and to a lesser degree in the mucosa. There was considerable hemorrhage in the interstices of the muscle in the mesenteric fat and the vessels of the mucosa were distended. There was much hemorrhage into the muscularis and the serosa of the intestine.

SUMMARY

A strain of *Pasteurella* which differs from *Pasteurella multocida*, in its failure to grow on ordinary mediums, to produce H_2S and NH_3 , and by producing a moderate degree of hemolysis, is described.

This organism is especially virulent, killing ducks after oral administration in about eighteen hours. Virulence was found unchanged after 100 subcultures on dextrose-starch agar. Virulent organisms were recovered from heart blood of ducks which had been stored in the refrigerator for three months. Histopathological changes are described.

This report represents the first authentic record of pasteurellosis in wild ducks.

ACKNOWLEDGMENT

Great appreciation is expressed to Dr. L. R. Vawter, of the University of Nevada, for going to considerable trouble in preparation of special delicate tests to verify our finding that the *Pasteurella* organism does not produce H_2S , and to Lieut. V. A. Cherrington, Sn. C., U. S. Army, and T/Sgt. R. F. Cousins, M. C., U. S. Army, for checking and verifying all cultural characteristics. We also wish to extend our thanks to Dr. Elizabeth Verder, U. S. Public Health Service, for studying subcultures submitted to her, and to Dr. Don R. Coburn, U. S. Fish and Wildlife Service, for offering helpful suggestions in the preparation of this paper.

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—From U. S. Egg & Poultry Magazine

Egg-producing plant in the Petaluma (California) district, known as the "World's Egg Basket." The district shipped over a million cases of white eggs last year—there are 30 dozen per case. According to the census of 1940, 39.3 per cent of the farms on the Pacific Coast raised more than 1,000 chickens each. In the balance of the United States but 6.5 per cent of the farms raised that many chickens.

Treatment of *Pasteurella Multocida* (Fowl Cholera) Infection in Wild Ducks with Autogenous Bacterin and Penicillin

LT. COL. F. B. QUEEN, M.C., and E. R. QUORTRUP, D.V.M.
Brigham, Utah

WHILE STUDYING an outbreak of pasteurellosis in wild ducks in Texas, some experiments in the treatment of the disease with penicillin were conducted. These are reported herewith.

The epizootic was caused by a hitherto undescribed strain of *Pasteurella multocida*.¹ A large number of ducks died in a relatively small area. The illness was apparently of short duration, for all the carcasses were in a good state of nutrition. The pathological findings were those of acute septicemia. The disease was readily transmitted, experimentally, from an immunized duck to healthy cagemates.

EXPERIMENTAL TREATMENT

1) *Autogenous Bacterin*.—Two green-winged teals, 1 mallard, and 2 pintails were used in these experiments. An autogenous bacterin was prepared by heating 24-hour plate culture suspensions to 50 C. for one hour, and adding 0.5 per cent phenol for preservation. One-half to 1 cc., depending on the size of the duck, was inoculated into the pectoral muscles twice, at seven-day intervals. At the second inoculation the dose was doubled. Seven days following the last inoculation, massive doses, 2 cc. of 24-hour plate culture suspensions of *P. multocida*,

TABLE I—Results of Treatment of Wild Ducks Orally Infected with *Pasteurella Multocida* (strain 800) with Large Doses of Penicillin, Intramuscularly

Infection and Treatment	Mallard (1)	Pintail (1)	Green-Winged Teal (1)	Controls		
				Mallard (2)	Pintail (2)	Green-Winged Teal (2)
5/3/44 10 a.m.	2 cc. 24-hr. plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hr. plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hr. plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hr. plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hr. plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hr. plate culture suspensions of <i>P. multocida</i> , orally
11 a.m.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.	No treatment	No treatment	No treatment
2 p.m.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.			
5 p.m.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.			
11 p.m.	3,000 u. Pen. I.M.	3,000 u. Pen. I.M.	3,000 u. Pen. I.M.			
5/4/44 8 a.m.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.	1,500 u. Pen. I.M.			
Totals	9,000 u.	9,000 u.	9,000 u.			
Results	Remained healthy	Remained healthy	Remained healthy	Died during night	Died 9:50 a.m. 5/4/45	Died 10 p.m. 5/3/45

u.=Units. I.M.=Intramuscularly.

Chief of Laboratory Service (Queen), Bushnell General Hospital, Brigham, Utah; U. S. Fish and Wildlife Service (Quortrup), Bear River Wildlife Disease Research Station, Brigham, Utah.

strain 800, isolated from one of the ducks dying in the epizootic, were inoculated, subcutaneously, into the 5 experimental ducks.

This preinfective inoculation gave good

protection against the infection, but 1 of the 5 died, and the others remained healthy.

Treatment of Pasteurella multocida.—This treatment is, of course, totally impractical for use with wild birds; therefore experiments were conducted with penicillin treatment.

2) *Penicillin.*—Although penicillin is ineffective against most gram-negative bacilli, nevertheless, in the hope that it might be effective against this strain of *P. multocida* (our strain 800), penicillin sensitivity determinations were made by both cup-plate and dilution methods. The organism, to our surprise, was consistently inhibited by concentrations of 0.08 units per cc., and experiments were instituted to determine its effectiveness in protecting experimentally infected wild ducks from the infection.

Two experiments were conducted. In the first, wild ducks, orally infected with 2 cc. of 24-hour plate culture suspensions of *P. multocida*, were given relatively large doses of penicillin, intramuscularly, (4 injections of 1,500 units and 1 of 3,000 units) over a 21-hour period, beginning one hour follow-

ing infection. These birds died two to four days after discontinuation of treatment, though all controls died within one day of infection. These experiments are summarized in table 1.

In the second experiment, 1,000 units of penicillin were administered, intramuscularly, at the time of infecting 3 green-winged teals, and 500 units were given, intramuscularly, every three hours over a period of sixty hours (15 doses with a total of 7,500 units), plus an additional 500 units on the eighth day for all 3 ducks, and 500 more on the ninth day for the 2 surviving ducks.

The control died eighteen hours following inoculation. One of the treated ducks died on the eighth day; the remaining 2 remained healthy throughout the treatment and for a period of one month thereafter, when observation was discontinued. These results are tabulated in table 2.

Treatment of Pasteurella multocida Infection.—In both experiments, the treatment was 100 per cent protective as long as it was continued. The second experiment

TABLE 2—Results of Treatment of Wild Ducks Orally Infected with *Pasteurella Multocida* (strain 800) with Small Doses of Penicillin, Intramuscularly (approx. 500 units per kg.)

Infection and Treatment		Green-Winged Teal 1	Green-Winged Teal 2	Green-Winged Teal 3	Control Green-Winged Teal 4
5/16/44	3 p.m.	2 cc. 24-hour plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hour plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hour plate culture suspensions of <i>P. multocida</i> , orally	2 cc. 24-hour plate culture suspensions of <i>P. multocida</i> , orally
		Pen. 1,000 u. I.M.	Pen. 1,000 u. I.M.	Pen. 1,000 u. I.M.	No treatment
	6 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	9 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	12 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
5/17/44	8 a.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Died
	11 a.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	2 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	5 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	8 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	11 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
5/18/44	8 a.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	2 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	9 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
5/19/44	9 a.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
	3 p.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
5/24/44	10 a.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	
5/25/44	10 a.m.	Pen. 500 u. I.M.	Pen. 500 u. I.M.	Died	
Totals		9,000 units 9 days	9,000 units 9 days	8,500 units 8 days	None
Results		Remained healthy	Remained healthy	Died 4/24/44	Died 11:30 a.m. 5/7/44

u.=Units. I.M.=Intramuscularly.

seems to indicate that the organisms were still harbored in the ducks for as long as eight days (following sixty hours of treatment, in at least 1 duck), following which time they may still kill the bird. It appears that penicillin is highly effective against organisms reaching the circulation but is less effective against those in the digestive tract, and that treatment must be continued until these are eliminated, a process requiring about eight days under the conditions of these experiments. Probably with continuous penicillin administration this period would be shortened.

In view of the above observations, we believe that an acute outbreak of pasteurellosis could be adequately treated with the administration of penicillin (500 u., intramuscularly) during the first day, with gradual reduction of the frequency of administration thereafter, and that treatment need not be continued longer than eight days, and probably a much shorter time would be sufficient. Autogenous bacterin would also be used in conjunction with penicillin, the latter being used to prevent mortality until active immunity could be established from the bacterin. The use of penicillin as previously described indicates its possible application as a treatment for hemorrhagic septicemia of large animals, which will be investigated.

CONCLUSIONS

- 1) Autogenous bacterin protects wild ducks against experimental infection with *Pasteurella multocida* (strain 800).
- 2) Penicillin protects wild ducks experimentally infected with *P. multocida* (strain 800).

¹Quortrup, E. R., Queen, F. B., and Merovka, F. J.: An Outbreak of Pasteurellosis in Wild Ducks. J.A.V.M.A., 108, (Feb., 1946) :94-100.

Pentothal-Metrazol Antagonism

Anesthesia with pentothal sodium has advantages which outweigh its disadvantages, and recent work indicates that the two most common faults may now be satisfactorily corrected. One is the prolonged period of sleep which sometimes occurs, and the other is the profound respiratory depression which is occasionally seen.

Metrazol exerts a rousing effect on patients anesthetized with pentothal, and it also stimulates resumption of respiration in

such patients. The dose of metrazol will vary with size of the animal and depth of narcosis.—*From Ann. Surg., April, 1945.*

Tuberculosis Eradication

The livestock industry will do well to abide by the conclusions of *Hoard's Dairyman* on the need of keeping alert on bovine tuberculosis, since neglect to retest and to eliminate reactors would lead to the same condition that existed a few years ago. The editor points out that ours is the only nation in the world that has been made nearly free of bovine tuberculosis—in spite of opposition to tuberculin testing and elimination of reactors—through the courage of those who wisely predicted the health and economic advantages of the project, and worked to that end. Quoting: "Let us have the courage and foresight to test our herds at least once in three years and we believe it better if we could test our herds at least once a year."

Reduction of Blood Volume Cardinal Factor in Shock

Critical biochemical and clinical studies (Stewart and Warner, *Ann. Surg.*, Aug., 1945) of 100 severely wounded air-combat casualties, which were caused by high explosive missiles, reconfirmed that reduction in the volume of blood is the dominant factor in traumatic shock. In the absence of clostridial myositis or burns, elevation of red cell hematocrit or plasma protein above the normal range was not in evidence. However, despite restorative treatment, anemia and hypoproteinemia continued through convalescence. Neither low plasma protein nor hemoglobin responded to quantitative restoration of blood volume. During early stages of convalescence, azotemia and dehydration were common states.

In 1855, James Bryan, A. M., M. D., professor of surgery in the Philadelphia College of Medicine, who was listed on the faculty of the Philadelphia Veterinary College chartered in 1852, made a strong plea for the founding of veterinary colleges in the United States, as did Dr. Benjamin Rush at the turn of the century (about 1806).

NUTRITION

Cobalt Deficiency

For many years the cattlemen of Florida have recognized a condition which they have called "salt sick." More recently, a similar condition has been recognized in the Grand Traverse area of Michigan and in Door county, Wisconsin. It is now recognized to

petite and become emaciated and weak. Some develop a depraved appetite. Digestive irregularity may be expressed as diarrhea or as severe constipation. The blood is pale and has a low hemoglobin content. Young cattle fail to grow, and sexual devel-



Fig. 1—Hereford heifer showing typical evidence of cobalt deficiency: unthrifty, gaunt, rough hair, and humped attitude.

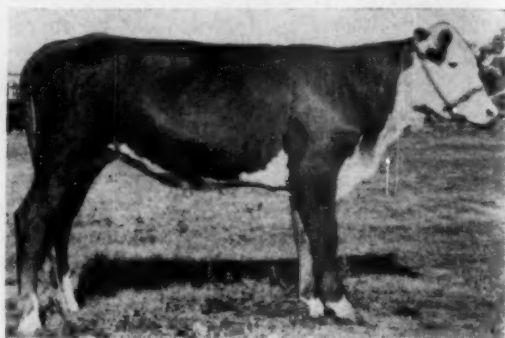


Fig. 2—Same heifer, several weeks later.

be a cobalt deficiency, largely through the work of Baltzer, Killham, Duncan, and Huffman, which is reported in the *Michigan Agricultural Station Quarterly Bulletin* (April, 1945).

Affected animals gradually lose their ap-

opment is retarded. Affected animals develop a long, rough coat of hair, a scaly skin, a gaunt and listless appearance, and muscular atrophy. Reproduction and lactation are unsatisfactory. The condition is seen most frequently in heifers between the ages of 6 and 30 months, but animals of all ages may be affected.

Treatment consists of supplying cobalt at



Fig. 3—Guernsey cow, showing characteristics of cobalt starvation in dairy cows.

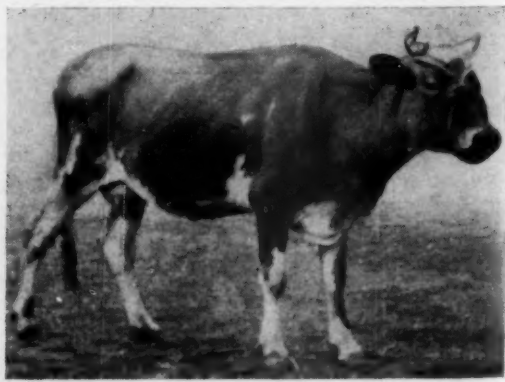


Fig. 4—Same cow, after cobalt had been added to the ration for only sixteen days.

the rate of 7 to 9 mg. per day; favorable response is often noted in a very few days after treatment is begun. The proper daily dosage may be supplied by feeding 1 teaspoonful of a solution of 1 oz. of cobalt sulfate (or cobalt chloride) dissolved in 1 gallon of water. For cattle that are not stabled, it may be simpler to mix 1 oz. of the cobalt salt in 100 lb. of salt. Overdosage may cause polycythemia, but the margin of safety is wide. As much as seven times the recommended dosage had no detrimental effect.

The illustrations, furnished by Prof. C. F. Huffman, show 2 animals before and after treatment for cobalt deficiency.

Is Ocular Epithelioma of Cattle Related to Vitamin A Deficiency?

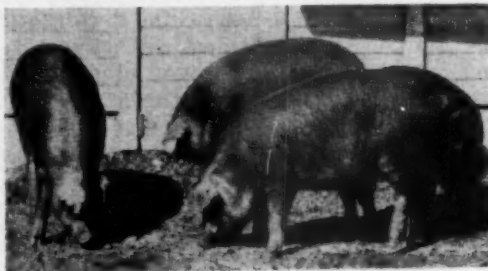
I am of the opinion that avitaminosis A is a factor in the development of epithelial tumors in the eyes of cattle. The growths seem to start as minute lesions that develop into tumors under favorable conditions. This idea is based upon the fact that epitheliomas are most common on the plains region where Herefords, the predominating breed, seem to be the most susceptible. There, cattle are on dry feed for long periods in the fall and winter, and in summer in the case of drought.

Actual avitaminosis A has symptoms similar to those seen in the early stage of eye tumors: lacrimation, conjunctivitis, impaired vision, and ulceration of the cornea. Vitamin A-deficient cattle develop edema of the muscles, rapid loss of weight, and sometimes pulmonary edema. It seems plausible that the two conditions are related.

I have noticed that warts on the head, neck, and breast of young cattle usually disappear after a run of about sixty days on succulent grass; and that eye tumors are rare in cattle fed alfalfa in winter as the principal feed. That young cattle are more susceptible to this cancer may be accounted for by the well-known facts that appreciable amounts of vitamin A are not stored by the body for any considerable length of time and that roughage exposed to the weather is a poor source of vitamin A, as it rapidly loses its carotene.—*David H. Bibbens, D.V.M., Kansas City, Mo.*

Gains in Hogs

Hogs which were fed salt, free choice, made much better gains than pigs which had no salt at all, in experiments made at the Agricultural Experiment Station of



—Morton Salt Co.

At the end of eighty-five days, these hogs at Purdue, which received no salt, averaged 174 lb.

Purdue University, Lafayette, Ind., even though they ate only 0.61 lb. salt per 100-lb. gain. They gained weight almost twice as rapidly, ate 173.5 lb. less feed per 100-lb. gain, and the cost per 100-lb. gain was \$3.85 less.



—Morton Salt Co.

At the end of eighty-five days, these hogs at Purdue, which were fed salt, free choice, averaged 255 lb.

In Iowa experiments, salt-fed hogs reached a predetermined weight in 158 days, while it took salt-hungry hogs 218 days to reach the same weight on the same rations. Under certain conditions, 1 lb. of salt may save as much as 213 lb. of feed.

According to Melnick, Hochberg, and Oser (*J. Nutr.*, Aug., 1945), the best way to determine the availability of certain vitamins is by urinalysis. The content of water-soluble vitamins, ascorbic acid, thiamin, riboflavin, and nicotinamide in urine runs parallel with the intake.

Value of Corn Cobs for Feeding

Experiments have been conducted during the past three years to determine the value of corn cobs in feeding steers. Three lots of steers were used in each instance: one was fed ground shelled corn, a second was fed corn and cob meal, while a third lot was fed corn and cob meal, with the addition of cobs equal in amount to those removed from the ration of the first group. In each instance, the corn and the cobs were finely ground so that the animals could not sort out the cobs and push them aside.

For each 100 lb. gain, the steers fed ground corn consumed 631.3 lb. corn; those fed corn and cob meal consumed 552.1 lb. corn and 129.2 lb. cobs; while those fed corn and cob meal with extra cobs needed only 477.7 lb. corn and 219.7 lb. cobs. Thus, in the first lot 79.2 lb. ground shelled corn was saved, giving the cobs a replacement value of 61.3 per cent; while in the other lot 153.6 lb. ground shelled corn was saved, giving the cobs a replacement value of 69.9 per cent in terms of shelled corn.

These experiments indicate that when corn and cobs are finely ground the feeding of corn and cob meal, or of corn and cob, plus extra cob meal, will produce a 100 lb. gain on less grain than will shelled ground corn.—*Mimeograph Series 52, Ohio Agric. Exper. Sta., Wooster.*

Pellagra, Blacktongue, and Corn

•Up to the 1920's, the use of corn as a staple of the human dietary was held responsible for causing pellagra—the grave deficiency disease closely related to canine blacktongue—which is endemic in southern Europe and southern United States. Although scientific proof was lacking, the corn-eating (zeistic) theory was hard to dismiss. Evidence against corn was strong. There had been no pellagra in Europe until corn was introduced from America, and the disease was relatively rare in northern United States, where corn was not “bread.” Yet attempts to prove either the sound-corn or the spoiled-corn hypothesis failed from lack of scientific evidence. Vitamins had not been discovered and, up to the 1920's, the knowledge of deficiency diseases was meager. It was not until 1926 that workers of the United States Public

Health Service (Goldberger, *et al.*, 1920-1926) discovered the pellagra-preventive (P.P.) factor of corn, a factor once tangled up with vitamin B₆, vitamin B₁₂, and nicotinic acid, or niacin. From 1926 to 1937, and beyond, the general impression was that nicotinic acid deficiency was the unique cause of pellagra. Later investigation proved, however, that the etiology is not that simple. Pellagra occurred where the intake of nicotinic acid was ample and was absent where the intake was low. All along, in the course of the investigational work, blacktongue in dogs, a comparable disease, helped to solve the mystery, which amounted to proving that nicotinic acid and corn are antagonists, that is, the larger amount of corn eaten the more nicotinic acid is required to prevent pellagra. The antagonism, already suspected by Goldberger and Wheeler in 1920, was not definitely proved until 1945. The work of Handler and Dann (1942), Handler (1943), and Krehl, Teply, and Elvehjem (1945), figures in clarifying the etiology of pellagra and blacktongue. The history of this chain of fascinating researches was reviewed in detail in *Nutrition Reviews*, September, 1945. “Pellagra, Blacktongue, and Corn” is historically significant as one of the prominent starting points of the present knowledge of vitamins in nutrition.

Wooley and Sebrell (1945) made the interesting observation that niacin deficiency can be fatal in rabbits in the absence of any symptoms except anorexia. To produce pellagra as in man, or blacktongue as in dogs, rabbits would probably have to be fed corn, these authors declare.

Clinical fluorosis in dairy cattle is manifested by unthriftiness, impaired growth, loss of weight, lowered milk yield, hypoplasia of the enamel, and declining appetite. *Post mortem*, the bones are white, porous, and soft, and show a high fluorine content on analysis. Fluorides are cumulative in ruminants. Cows may sicken quite suddenly after consuming non-defluorinated mineral supplements for a long time.

Sulfanilamide fed to bees twice a year prevents foul brood.

EDITORIAL

Why an AVMA Research Fund?

THE CAMPAIGN to raise a research fund of \$100,000 from members of the veterinary profession was recently announced in veterinary publications. (See the January, 1946, JOURNAL, p. 55.)

The purposes which the proposed research fund will serve are two-fold:

1) To advance knowledge in both the basic and applied aspects of veterinary science.

2) To assist in the training of promising young scientists in these fields by affording them financial support, in the form of fellowships, for graduate education.

Experience shows that we cannot estimate the amount and usefulness of new knowledge that may be acquired through research. Horizons are constantly expanding. One who would have been so wise and so bold, twenty years ago, as to have accurately estimated the advances made through scientific research between 1925 and 1945 would have been regarded as a wild dreamer. Only a wild dreamer today could predict, in all probability, the advances that will be made in the next twenty years. The only thing about the scientific future that we can safely predict is that many advances are certain to occur in all fields which affect human life and well-being. Advances will be greater in some fields than in others, depending upon the amount and quality of the research work that is done in them. We know this is true from our experience with the past. It is our wish and hope that veterinary medicine will advance with the other professions. To attain this end we must see that research in this field is not neglected.

Up to the present, scientific progress in the veterinary field has been slow because of lack of adequate financial support. This has determined the small numbers of persons who have worked in this field, and the imperfect and inadequate training of many of those who have been identified with it. The opportunities in veterinary

research as a career have been too meager to attract many capable men. It has been said, with much truth, that academic research must be its own reward, for persons engaged in it must serve because of love for their work rather than for financial gain. It must be pointed out, however, that scientists as well as others must eat and generally must support families. Hence the saying should not be taken too literally.

The training of research specialists is done in post-graduate schools. Few veterinary graduates have the means to pursue such work. If more research apprentices are to be trained, we must supply financial help to them. We expect that this campaign will supply funds to the Research Council of the AVMA to provide such help to many who will make up our next generation of veterinary research workers.

Since knowledge in all fields is growing, we must grow also if we are to retain the respect of the public. In the past, veterinary medicine has drawn heavily on the output of medical research laboratories for knowledge, especially in the basic sciences. This we will continue to do in the future. However, it is essential for our own professional good and self-esteem that we derive for ourselves more of this knowledge and depend less on outside sources for it.

If the veterinary profession expects to grow by developing better methods and more exact procedures, it must recognize certain facts:

1) We do not have enough men, well-trained in research methods, for the work that must be done.

2) We do not have enough well-trained specialists to staff the teaching positions of our present veterinary schools. The new schools that are now being formed make this problem even more acute.

3) We do not have enough funds to support adequately the few research workers that we now have.

4) We do not have enough well-trained research men to train the younger potential workers that are coming along.

What are we going to do about these matters?

We are putting this question up to all of those who are interested in any aspect of veterinary service. We are putting this question first to you, the members of the profession that is most directly concerned. We expect that you will show your recognition of this problem and your interest in its solution by contributing liberally to the fund that we propose to raise. Let no member of the profession deceive himself by thinking that this is not a matter of immediate concern to him. It is—unless the welfare of the whole profession is of no concern to him.

The funds realized from this campaign will be administered by the Research Council of the American Veterinary Medical Association. This Council was organized in 1942 to administer any research fellowship funds that might become available to it. This Council will select the fellows, approve the projects upon which they propose to work, and make arrangements with the institution where they will work. The Council consists of 15 members, all outstanding men in their respective fields. The present members and the fields which they represent are as follows:

Anatomy and Histology.—H. L. Foust, Professor of Veterinary Anatomy, Division of Veterinary Medicine, Iowa State College, Ames.

Bacteriology (Immunology and Biologic Therapy).—Edward Records, Research Professor of Veterinary Science, University of Nevada, Reno.

Biochemistry and Animal Nutrition.—George H. Hart, Head, Division of Animal Husbandry, University of California, Davis.

Large Animal Medicine.—James Farquharson, Professor of Surgery and Clinics, Division of Veterinary Medicine, Colorado A. & M. College, Fort Collins.

Large Animal Surgery.—W. F. Guard, Professor of Surgery and Obstetrics, College of Veterinary Medicine, The Ohio State University, Columbus.

Parasitology.—E. W. Price, Assistant Chief, Zoological Division, Bureau of Animal Industry, Beltsville Research Center, Beltsville, Md.

Pathology.—E. T. Hallman (Chairman, Research Council), Professor of Pathology, School of Veterinary Medicine, Michigan State College, East Lansing.

Physiology and Pharmacology.—H. H. Dukes, (Secretary, Research Council), Professor of Veterinary Physiology, New York State Veterinary College, Cornell University, Ithaca.

Poultry Pathology.—C. A. Brandly, Department of Veterinary Science, University of Wisconsin, Madison.

Small Animal Medicine.—M. L. Morris, Practitioner, New Brunswick, N. J.

Small Animal Surgery.—C. F. Schlottbauer, Associate Professor, Division of Experimental Medicine, Mayo Foundation, Rochester, Minn.

Veterinary Hygiene.—Chas. A. Mitchell, Animal Disease Research Institute, Hull, Quebec.

Virus Diseases.—R. A. Kelser (Vice-Chairman, Research Council), Dean, School of Veterinary Medicine, University of Pennsylvania, Philadelphia.

X-Ray.—M. A. Emmerson, Professor of Veterinary Obstetrics, Division of Veterinary Medicine, Iowa State College, Ames.

Member-at-Large.—Hadleigh Marsh, Agricultural Experiment Station, Bozeman, Mont.

The Council is interested primarily in selecting promising young men for these fellowships. The fields in which they will work is of secondary interest, although an effort will be made to stimulate work in the basic sciences as well as on problems that are of immediate practical importance. The fellows may work in nonveterinary as well as in veterinary institutions, so long as the Council feels that the training received will ultimately benefit and advance veterinary science. Only those who are citizens of the United States and Canada will be eligible for these fellowships. Usually arrangements for fellowships will be consummated by a grant to the institution where the fellow will work, from which it will pay the stipend to the student in periodic installments. These stipends will be calculated so as to provide for moderate living expenses of the students while they are studying. Generally, educational institutions will cooperate in maintaining fellowships of this kind by waiving part or all of the ordinary tuition fees. Fellows maintained by the fund will be free to de-

vote their full time to their studies; they will not be required to teach or do other routine work unless a limited amount of such service is agreed to by the fellow and the Council at the time the grant is made.

The purposes of the fund are indicated at the beginning of this statement. We have dealt here principally with the second purpose. This objective may be regarded as a means toward an end. The real end that we hope to attain is indicated by the first purpose, namely, to advance knowledge in all fields of veterinary science. Its practical achievement depends upon having sufficient well-trained manpower in the research and teaching fields. This is our immediate aim. Later we will elaborate on problems that need solution by research.

Special Committee on Financing Research

J. V. LACROIX, *Chairman.*

W. A. HAGAN

C. C. HASTINGS

A Veterinary Service for the Army Air Forces

The addition of a Veterinary Branch to The Air Surgeon's Office, as announced elsewhere in this JOURNAL, is a recognition of the importance of veterinary public health work, which should be gratifying to all members of the profession. The Air Surgeon is to be congratulated for his foresight in providing a service that will enable the Army Air Forces to deal intelligently and effectively with the many questions that doubtless will arise in the peacetime activities of the air arm, including the demonstrated value of veterinary inspection of foods as a health measure for air force personnel. In the more-or-less global operations affecting United States possessions and bases for which the Army Air Forces will be called upon in the foreseeable future, there will also be questions of animal disease, sanitation control, and quarantine which will be of national and international concern. The problem of insect vectors of disease may also be cited. Consequently, it is important that there should be available to the Army Air Force headquarters immediate and skilled veterinary advice in the formulation of policies and in the coordination of veterinary matters with other agencies.

Although a total of some 8 million members of the armed forces were deployed in all parts of the globe in World War II, wholesomeness of their food was guarded everywhere and cases of illness among the men as a result of unfit food were practically nonexistent. As a matter of fact, the disease rate and death-from-disease rate in the Army was below the prewar peacetime rate. Such a record is due to the combined efforts of all medical agencies, and the part played by the veterinary service is not to be underestimated.

A considerable percentage of veterinary personnel was assigned to the Air Forces during the war and the officers and men of the Veterinary Corps are to be commended for having done their work so well as to merit the recognition inherent in the Air Forces' decision to establish a veterinary branch. Lt. Colonel Benjamin D. Blood, V.C., who has been assigned as the first chief veterinarian of the Army Air Forces, brings to the position a background of training and experience which augurs well for the success of the work and the veterinary profession's interest in this newly expanded field.

Wartime Veterinarians, U. S. Army, in 1863

War Department General Order No. 73, 1863, issued by virtue of Congress, was the first recognition given to veterinarians by the U. S. Army. It provided for one "veterinary surgeon for each of the six regiments of cavalry at \$75 a month." The pay was increased to \$100 a month in 1866. The next important step was the Act of Congress of 1879, providing that, "these cavalry veterinarians shall be graduates of recognized veterinary colleges."

Preterite Notes

The December 1880 issue of this JOURNAL contains the report of a French soldier who died four and a half years after having been bitten by a rabid dog. The case was reported to, and closely investigated by, the French Academy of Medicine. Another soldier bitten at the same time by the same dog had died in forty days and the victim of the long period of incubation had not been exposed during the interim.

CURRENT LITERATURE

ABSTRACTS

Glucose Administration

What effect on the respiratory quotient, in respect to the preceding diet, has the administration of glucose? That is, what effect has glucose on carbohydrate combustion, independent of the combustion of the glucose itself? Using two students as the experimental subjects, it was shown that the level of carbohydrates in the preceding diet had a noticeable effect on carbohydrate combustion and that the increase in its combustion was also noticeable but not as much as would be expected after the administration of glucose, in view of the demand for the replacement of glycogen.

The basal combustion, calculated up to three hours for the three dietary levels used, was 12.0, 6.1, and 0 Gm. in one subject and 13.4, 7.1, and 2.1 Gm. in the other. The increases after the ingestion of glucose were, respectively, 14.0, 8.7, and 7.9 Gm., and 8.7, 5.9, and 4.8 Gm.—[Robert F. Root, and Thorne M. Carpenter: *The Effect of the Dietary Supply of Carbohydrate upon the Response of the Human Respiratory Quotient after Glucose Administration*. *J. Nutr.*, 30, (Nov. 10, 1945): 333-341.]

Malignant Lymphoma Not Leucemia

The designation, malignant lymphoma (so-called leucemia), has been applied to a systemic disease of dogs in which the lymph nodes, spleen, and liver are usually enlarged. Microscopically, diffuse and nodular cellular infiltrations involve these organs as well as the bone marrow, adrenals, lungs, kidneys, prostate, tonsils, third eyelids, gall bladder, pancreas, and Peyer's patches.

The peripheral blood shows anemia and usually polymorphonuclear leucocytosis, and is therefore not comparable to the true leucocythemia in human malignant lymphomas. Thus the term, leucemia, is inadmissible for the canine disease.

Clinically, the disease is subacute, irrespective of the predominant cellular type, in contradistinction to the usual findings in man.—[Frank Bloom, Flushing, and Leo M. Meyer, Brooklyn. *N. Y.: Malignant Lymphoma (So-Called Leukemia) in Dogs*. *Am. J. of Path.*, 21, (1945): 683-715.]

BOOKS AND REPORTS

Vesicular Stomatitis

The first outbreak of this disease which occurred naturally among swine has been made the subject of a bulletin. In this outbreak, 417 of 767 large hogs developed the disease, while only 1 of approximately 500 virus, test, and stocker pigs became infected. Twelve yearling calves were refractory to direct and indirect exposure to infected swine.

Differential tests on several species of animals established the condition as vesicular stomatitis, and other tests showed that the disease-producing substance was a filter-passing organism. No definite source of the virus causing the outbreak was found.—[H. W. Schoening and A. B. Crawford: *Outbreak of Vesicular Stomatitis in Swine and Its Differential Diagnosis from Vesicular Exanthema and Foot-and-Mouth Disease*. Circular 734, July, 1945, United States Department of Agriculture, Washington, D. C., 14 pages.]

Recommended Nutrient Allowances for Dairy Cattle

This report is the third of a series of this character by the Committee on Animal Nutrition of the National Research Committee, and it represents the first attempt in the history of animal nutrition to develop nutrient standards for farm animals by a committee of nutritionists. The report opens by stating that in order to achieve optimum efficiency in dairy production it is essential to satisfy the nutritive requirements of the animals for growth, reproduction, and lactation.

It then proceeds to outline the nutritive requirements, not in terms of a minimum, but in terms of a safe margin, and to discuss individually each factor of nutrition. Illustrated to show the effects of some deficiencies, it also shows what may be expected when the ration is corrected. Directions are given for a balanced ration, and a few of the feeds that are commonly fed to dairy cows are listed, to show their composition.

This report is a careful digest of many feeding trials, interpreted for use in the cow barn,

and will prove a very convenient reference for the veterinarian interested in the effect of nutrition on animal health.—[*Recommended Nutrient Allowances for Dairy Cattle. Number III in a series of "Recommended Nutrient Allowances for Domestic Animals."* By Prof. J. K. Loosli, C. F. Huffman, W. E. Peterson, and P. H. Phillips. National Research Council, 2101 Constitution Ave. N.W., Washington 25, D.C. Paper. 25 cents.]

Dairy Bacteriology Manual

This is an outline which may be useful to veterinarians and others concerned with the bacteriology and public health aspects of market milk production. It is the basis of a course in teaching veterinary students and serves as a reminder of items which must be kept in mind rather than as a careful enumeration of procedures to be followed.

Subjects considered include the composition of milk, the various grades of market milk, and tests to determine the bacteriological quality of the product. There are mentioned some of the sources of high counts and methods of production, handling, and transportation to keep the plate counts down. In conclusion, there is suggested a method for the inspection of a city milk supply, including examination of the cow, inspection of the farm, and inspection of the processing plant.—[C. S. Bryan, D.V.M., Professor of Surgery and Medicine, Michigan State College, East Lansing: *Dairy Bacteriology and Public Health*. 33 pages. Mimeograph. Burgess Publishing Co., Minneapolis 15, Minn.]

Report of the Ontario Veterinary College

The report (dated March, 1945) of this college for 1944 to the provincial Minister of Agriculture gives the total enrollment as 113, representing all of the Canadian provinces, Great Britain, and the United States. The course requires five years, leading to the degree of Bachelor of Veterinary Science (B.V.Sc.). The applicant for admission complies with requirements of the University of Toronto of which the college is a department. The final examinations are given under the jurisdiction of the Senate of the University. Graduate courses lead to the degree of Doctor of Veterinary Science (D.V.Sc.), Master of Veterinary Science (M.V.Sc.), and Diploma of Veterinary Public Health (D.V.P.H.). Special courses are given in public health work, fur farming, and practice for veterinarians. The college conducts a clinical and laboratory service for horses, cattle, hogs, sheep, small animals, and fur-bearing animals, and a laboratory service for

poultry, in addition to research and investigation. The college also coöperates with the provincial practitioners in the control of bovine brucellosis. The extent of these activities is shown in tabulations by the heads of the different departments, each introduced with descriptive remarks.—[*Report of the Ontario Veterinary College*. 32-page bulletin. Edited by C. D. McGilvray, Principal, Guelph, Ont.—Retired May, 1945.]

Your Dog in the City

If, as seems true, there are 15 million dogs in the United States, or three times more than yesteryear, plus the presumption that most of them are in city homes, there should be a rising market for books on their care. No other domestic animal is as frequently taken from the mother's breast prematurely and given over to the keeping of care-free children, without understanding of the difference between living and nonliving toys or given to grown-ups who think of dogs as something to toss bones to.

This is the kind of book on animal care that only Experience can write. In writing on that subject, only the connoisseur with practical experience can say *this is how I do it*, without blundering through a lot of comedy. Whether the chapter is on reproduction, "Pup-piatrics," nutrition, training, or disease, there is a point at which the professional takes over. No reader realizes better than the competent husbandman that such a point exists. While an occasional stepping over the borderline between lay and professional knowledge is an expectation, none is quicker to sense the unreasonable than the intelligent reader. This is the day of monographs of the specialist or of polynomic anthologies. There is no time wasted on guess work.

The context of this book is stamped *Experience* and is well told, but the chapter on disease should have been reviewed by someone capable of removing technical errors and misstatements of medical facts. The way the author tells the reader to consult, barge over to, or quickly run for, a veterinarian shows a keen insight into the relative emergency of canine ailments. But, since no chain is stronger than its weakest link, it is always sad to note that many fine books on the care of animals are spoiled by pedantic pathology. Nevertheless, this book is suitable for dog owners and their children, to whose care so many living Christmas presents are entrusted.—[Helen Greenfield: *Your Dog in the City*. Cloth. 117 pages. Indexed. Crown Publishers, New York. Price, \$1.00.]

Crossroads for Penelope

If you're wise to the title of this book, you've read "Pattern for Penelope" (THE JOURNAL, March, 1944), and know the sort of epic theme an observing novelist can find in the life of a rural veterinarian and his entourage. Site: New Jersey to Colorado, and parts west. A community rich in livestock, purebred dogs, miscellaneous fauna, and the fairs, bench shows and social events emerging therefrom, is the stage set for the dramatization of Dr. Drake's domestic and professional career, and of Penny, a conventional, teen-age city girl, growing to womanhood under the influence of his home and the inspiration of multiple victories, failures, and heart-breaking tragedies that overtake the clinical veterinarian, his clients, and his promiscuous unfortunates. So help me gosh, the reading of these two books is a must do. They lift morale and teach a lesson on the kind of ethics that pay.

But to get on, the object of this review is specific. There is a big gap to fill in our records on war dogs—war records this and other columns of the JOURNAL have tried to keep ever since the War Department decided to form a K-9 Corps "for the duration." But just how these canine selectees were collected from scattered donors all over the country was never well told. How was this gargantuan emergency accomplished, and what were the scenes at the homes of the war-dog donors when the family yielded to the patriotic desire to add their pet to the recruits of the K-9 Corps? How did Dogs for Defense handle this delicate situation all the way from the delectable home dog to the no-account animal someone wanted to get rid of? Whomsoever is wise to the attachment of man and animal, especially dogs, knows that the mental tether may be as hard to break as the desire is strong to peddle a skalawag dog for local notoriety. The task of collecting thousands of dogs of the right sort from all over the country was accomplished in effect by forming a disciplined organization of committees chosen from going community societies, whose chairmen appointed crews of two to proceed to the donors' homes and pass on the fitness of the dogs offered. To forestall hordes of misfits from being shipped to the remount stations, expertness and good judgment on the part of these working units were essential.

No writer of historical novels on a country's clinical veterinary service has ever seen the life of the modern veterinarian in general practice so clearly as the author of "Pattern for Penelope" and "Crossroads for Penelope," nor has one brought in such fine characters to tell the story. Each of these is a scenario of real people at work, with a wholesome love affair

woven in. You'll not turn out the light until "The End," and you'll be glad Penny and Tom made up. Reviewing affairs of the heart is the other fellow's job. Suffice to explain that Penny (Penelope Austin), now through with the war dogs, gives more help to busy Uncle Doctor (Dr. Drake, D.V.M.) in the operating room and hospital; Tom (Pfc. Thomas Greer), the doctor's former assistant, is still in the Army and going to a veterinary college; and Rick (Lt. R. Canfield), convalescent casualty of the war on sick leave, handler with the small arms used to test gunshyness than Aunt Sue (who was gunshy herself), worked themselves into one of those transient premarital triangles—Penny, Tom, Rick—that "busted" Tom's and Penny's engagement, produced days of worry, sleepless nights, anorexia, ring returned, an' everything prodromal to the sensible reconciliation of normal minds.

We don't know whether a third "Penelope" is in the writing, but here's our prediction of things to come. Penny and Tom are going to get married, and Uncle Doctor and Aunt Sue will set off to California for a long vacation, lured by the mirage of retirement, and eventually long in vain for the useful life they once enjoyed.—[*Crossroads for Penelope*. By Mary Wolfe Thompson, with cover decorations by James MacDonald. Cloth. 264 pages. Longsman, Green and Company, New York and Toronto. 1945. Price \$2.00.]

Medicinal Chemicals

The veterinary practitioner finds that he gets the best results from the drugs he knows best. To help the veterinarian know old drugs better, as well as to introduce him to others equally deserving of his confidence and his use in practice, a note book has been prepared which discusses the mechanism of drug action and the specific actions of some veterinary products.—[*Note Book of Original Medicinal Chemicals*. Veterinary Edition. Bilhuber-Knoll Corporation, Orange, N. J., 54 pages.]

If interested in atomic energy read "Atomic Energy for Military Purposes," published by Princeton University Press, under the direction of Maj. Gen. L. R. Grove, who had charge of the atomic bomb project. The author is Henry DeWolf Smyth, Department of Physics, Princeton University. Not too technical for the average reader. 280 pages with drawings and photographic illustrations. Cloth, \$2.00.

THE NEWS

AVMA Activities

Research Council Fellowships Now Available

Dr. E. T. Hallman, chairman of the AVMA Research Council, has notified the deans of accredited veterinary colleges of the availability of several fellowships and that applications for these for the college year 1946-1947 will be accepted by the Council up to April 1, 1946.

Fellows will be selected on the basis of recommendations, scholastic attainments, and promise in the field of research. They will be assigned to some institution to devote full time to graduate work and will not be required to teach or do other routine work unless a limited amount of such service is agreed to by the fellow and the Council at the time the grant is made.

Fellowship stipends will be calculated to provide moderate living expenses while the student is working on the project and will be approximately \$100.00 per month.

Application forms may be obtained from Dr. H. H. Dukes, Secretary, AVMA Research Council, New York State Veterinary College, Ithaca, N. Y.

The activation of these fellowships at this time is a partial result of the recently inaugurated campaign to raise a sizeable veterinary research fund by contributions from members of the veterinary profession first, to be followed by an appeal for a still larger sum through donations from other individuals and organizations interested in promoting veterinary science and animal welfare.

The news editor appreciates the receipt of printed programs of coming meetings. As these are published in the past tense, advice concerning changes and important features of the meeting, not contained on the printed program, will help to keep the "Among the States" column complete and correct. It is particularly desirable to receive a report on the election of officers as soon as possible.

It is also helpful to have the speakers and participants in a meeting identified—as to their field, if veterinarians, otherwise whether they are physicians, laymen, etc.

Colonel Foster Presents Army Veterinary Bulletins to AMVA Library

Colonel Robert J. Foster, V.C., retired, and president of the Association in 1936-1937, has presented his collection of the *Veterinary Bulletin*, publication of the Veterinary Division, Office of The Surgeon General, to the AVMA library. The set is beautifully bound, comprises 13 volumes, and includes 26 volumes of the bulletin from Vol. 1, No. 1, issued Jan. 14, 1920, to Vol. 26, No. 4, issued in October, 1932.

In the foreword to Volume 1, Colonel C. F. Morse, M.C., first director of the Veterinary Corps and who did much to help guide the army veterinary service in its formative stages, said, in part:

There has been apparent for a long time the need of a getting-together of veterinary officers. Veterinarians, like other professional men, are individualists in relation to the practice of their profession. . . . We should encourage a spirit of enthusiastic loyalty to his corps on the part of every veterinary officer. He should look on the Veterinary Corps as peculiarly his own, and something for the making or marring of which he cannot evade personal responsibility. He should constantly strive to advance its interests and its efficiency and maintain its standards at a high level.

A mutual understanding of our problems is a primary requisite. . . . We need to discuss both our successes and our failures. . . . One of the main purposes in the initiation of this Bulletin is to meet this need.

Through the years, the *Veterinary Bulletin* has reflected the steady progress of the work of the Veterinary Corps and its changing and expanded field of activity. It has published many original articles by veterinary officers stationed throughout the world, periodic reports on the health status of army animals, personnel changes, and in all is a splendid record of the development of the Veterinary Corps in all its phases.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

ALEX, CHARLES

4154 W. Van Buren, Chicago 24, Ill.
D.M.V., University of Berne, Switzerland,
1930.

Vouchers: E. M. Lynn and W. S. Buchannan.

BAUTISTA B., ALFONSO

Calle Bolivar No. 22, Coro. Estado Falcon,
Republica de Venezuela, S. A.
D.M.V., Facultad de Veterinaria, Bogota, Co-
lombia.

Vouchers: C. E. Muskus and J. G. Harder-
bergh.

COVERT, MILTON H.

260 Inglewood Dr., Rochester 11, N. Y.
D.V.M., Cornell University, 1938.

Vouchers: L. J. Desson and F. F. Fehr.

GARDINER, MEREDITH R. JR.

123 County Line Rd., Bryn Mawr, Pa.
V.M.D., University of Pennsylvania, 1940.
Vouchers: D. L. Coffin and D. K. Detweiler.

KAFKA, HELLMUT

33 E. Upsal St., Philadelphia 19, Pa.
D.M.V., Tierärztlichen Hochschule, Vienna,
Austria, 1935

Vouchers: J. D. Beck and D. L. Coffin.

PEASE, RAY H.

2017 Russell Ave., Cheyenne, Wyo.
D.V.M., Colorado State College, 1927.
Vouchers: H. E. Kingman and R. Jensen.

PERLAZA S., FRANCISCO ANTONIO

Apartado Nacional 383, Cali, Valle, Colombia,
S. A.

M.V., Facultad Nacional de Medicina Veter-
inaria, Bogota, 1937.

Vouchers: R. P. Guerrero and C. A. Rojas.

PINCKARD, WENDELL L.

P. O. Box 381, Cleveland, Tenn.
D.V.M., Alabama Polytechnic Institute, 1937.
Vouchers: D. Coughlin and F. P. Woolf.

RADMORE, R. C. S.

531 Rideau St., Ottawa, Ont., Can.
B.V.Sc., Ontario Veterinary College, 1940.
Vouchers: C. A. Mitchell and C. Kealey.

STEARN, BENJAMIN F.

No. 2—Second Ave., Haddon Heights, N. J.
V.M.D., University of Pennsylvania, 1937.
Vouchers: W. S. Miller and F. E. Lentz.

Second Listing

Brown, James R., 100 Jackson St., Demopolis,
Ala.

Bunde, Harold J., Bowling Green, Mo.

Cheng, Ching-Tuan, National Research Bureau
of Animal Industry, Nanking, China,

Farrell, Joseph M. Jr., P. O. Box 65, Lindale,
Texas.

Sullivan, J. Ralph, 232 Lee St., Montgomery,
Ala.

Webster, John S., Schomberg, Ontario, Can.

1946 Graduate Applicants First Listing

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute

ANDERSON, WILLIAM M., D.V.M.

1134 Sampson Ave., Dyersburg, Tenn.

Vouchers: I. S. McAdory and W. E. Cotton.

Kansas State College*

ALT, THEODORE W., D.V.M.

1115 Bluemont Ave., Manhattan, Kan.

Vouchers: E. E. Leasure and J. H. Burt.

BRUSCHEL, LORENZ L., D.V.M.

LaCygne, Kan.

Vouchers: M. S. Cover and E. E. Leasure.

BOEBEL, FREDERICK W., D.V.M.

Rt. 1, Box 30, Naperville, Ill.

Vouchers: E. E. Leasure and R. R. Dykstra

BOHMKER, FRED A., D.V.M.

929 Brookridge Ave., Ames, Iowa.

Vouchers: E. E. Leasure and E. R. Frank.

BORGSMANN, AUGUST R., D.V.M.

1723 Fairview, Manhattan Kan.

Vouchers: E. E. Leasure and E. J. Frick.

BURE, JAMES H., D.V.M.

131 Mill St., Covington, Va.

Vouchers: E. E. Leasure and R. R. Dykstra.

CHURCH, JOHN W., D.V.M.

Jerico Springs, Mo.

Vouchers: E. E. Leasure and M. S. Cover.

COOK, MORLEY H., D.V.M.

c/o Fred Johansen, Holyrood, Kan.

Vouchers: E. E. Leasure and E. J. Frick.

CRAWFORD, DALE I., D.V.M.

Overbrook, Kan.

Vouchers: E. E. Leasure and R. R. Dykstra.

DUKE, LLOYD M., D.V.M.

Big Cabin, Okla.

Vouchers: R. P. Link and E. E. Leasure.

EASLEY, GLYNDEN T., D.V.M.

Box 448, Portales, N. M.

Vouchers: E. E. Leasure and E. R. Frank.

ENGLAND, REID B., D.V.M.

1738 Fairchild, Manhattan, Kan.

Vouchers: E. E. Leasure and R. R. Dykstra.

- FELLMAN, CLARENCE K., D.V.M.
Osage City, Kan.
Vouchers: E. E. Leasure and M. S. Cover.
- FENYK, JOHN R., D.V.M.
Rutland Rd., Harlingen, N. J.
Vouchers: E. E. Leasure and E. R. Frank.
- FINKELSTEIN, ALEX B., D.V.M.
Box 100, Kansas State College, Manhattan, Kan.
Vouchers: E. E. Leasure and M. S. Cover.
- GESELLCHEN, VICTOR W., D.V.M.
1741 Anderson, Manhattan, Kan.
Vouchers: E. E. Leasure and E. R. Frank.
- GREATHOUSE, LEONARD F., D.V.M.
237 S. Ashland Ave., Lexington, Ky.
Vouchers: M. S. Cover and E. E. Leasure.
- HAGGARD, JOHN M., D.V.M.
Altamont, Kan.
Vouchers: E. E. Leasure and M. S. Cover.
- HARDIN, RUSSELL W., D.V.M.
R.R. No. 2, Knightstown, Ind.
Vouchers: E. E. Leasure and R. P. Link.
- HARVEY, MAX J., D.V.M.
Kinsley, Kan.
Vouchers: E. E. Leasure and E. J. Frick.
- JACKSON, WILLIAM R., D.V.M.
116½ S. First St., Rogers, Ark.
Vouchers: G. R. Moore and E. J. Frick.
- JOHNSON, MARVIN, D.V.M.
517 N. 14th St., Manhattan, Kan.
Vouchers: E. E. Leasure and E. R. Frank.
- KEESER, PAUL A., D.V.M.
Rt. No. 1, Holdenville, Okla.
Vouchers: E. E. Leasure and E. R. Frank.
- KELLER, GARTH V., D.V.M.
R.F.D. No. 3, Mt. Carroll, Ill.
Vouchers: E. E. Leasure and E. R. Frank.
- KELLY, HAROLD M., D.V.M.
Verdon, Neb.
Vouchers: E. E. Leasure and E. J. Frick.
- KERN, DOYLE E., D.V.M.
R.R. No. 3, Box 253, Ft. Collins, Colo.
Vouchers: E. E. Leasure and R. R. Dykstra.
- KING, ROBERT K., D.V.M.
Rt. No. 1, Broken Arrow, Okla.
Vouchers: E. J. Frick and E. E. Leasure.
- KROMMINGA, MYRON C., D.V.M.
Lennox, S. Dak.
Vouchers: E. J. Frick and R. R. Dykstra.
- LEVINE, ISAAC, D.V.M.
2024 Thackrey, Manhattan, Kan.
Vouchers: E. E. Leasure and M. S. Cover.
- LIGHTLE, WILLIAM T. JR., D.V.M.
Box 410, Globe, Ariz.
Vouchers: E. E. Leasure and E. R. Frank.
- LINDSEY, PAUL J., D.V.M.
Willacoochee, Ga.
Vouchers: E. E. Leasure and R. R. Dykstra.
- LITT, ROBERT P., D.V.M.
6852 Paxton Ave., Chicago, Ill.
Vouchers: E. E. Leasure and R. R. Dykstra.
- MCLAUGHERY, LARRY E., D.V.M.
Arlington, Neb.
Vouchers: E. E. Leasure and R. R. Dykstra.
- MCCULLY, SAMUEL M., D.V.M.
LaRose, Ill.
Vouchers: E. E. Leasure and R. R. Dykstra.
- McGOWN, MURLIN L., D.V.M.
McCune, Kan.
Vouchers: E. E. Leasure and M. S. Cover.
- MAXFIELD, ALBERT, D.V.M.
2955 Holcomb Rd., Kansas City, Kan.
Vouchers: E. E. Leasure and M. S. Cover.
- NAGAKURA, ROY S., D.V.M.
17 Kilohana St., Hilo, Hawaii.
Vouchers: E. E. Leasure and E. R. Frank.
- NIPPER, ORRIS W., D.V.M.
Magnolia, Ark.
Vouchers: E. E. Leasure and M. S. Cover.
- NOORDSY, JOHN L., D.V.M.
Marion, S. Dak.
Vouchers: E. E. Leasure and E. R. Frank.
- PRITCHARD, WILLIAM R., D.V.M.
Randolph, Wis.
Vouchers: E. E. Leasure and E. R. Frank.
- RATLIFF, TEDDY B., D.V.M.
Portis, Kan.
Vouchers: E. E. Leasure and R. R. Dykstra.
- ROSS, ERVEN A., D.V.M.
421 N. 16th, Manhattan, Kan.
Vouchers: E. E. Leasure and E. J. Frick.
- RUNNELS, LEWIS J., D.V.M.
1607 N. Waco, Wichita, Kan.
Vouchers: E. E. Leasure and E. J. Frick.
- SCARR, DAVID N., D.V.M.
70 Mertz Ave., Hillside, N. J.
Vouchers: L. M. Roderick and E. E. Leasure.
- SCHULTZ, GEORGE W., D.V.M.
Shattuck, Okla.
Vouchers: E. E. Leasure and E. J. Frick.
- SHIVELY, JAMES N., D.V.M.
R.F.D. No. 1, Moran, Kan.
Vouchers: E. E. Leasure and E. J. Frick.
- SIGARS, GAROLD O., D.V.M.
1827 Frederick Ave., St. Joseph, Mo.
Vouchers: E. E. Leasure and R. R. Dykstra.
- SIMON, JOSEPH, D.V.M.
Duaneburg, N. Y.
Vouchers: E. E. Leasure and R. R. Dykstra.
- SNIDER, LEWIS A., D.V.M.
5288 Pleasant Run Blvd., Indianapolis, Ind.
Vouchers: E. E. Leasure and E. R. Frank.
- SORENSEN, DALE K., D.V.M.
Centuria, Wis.
Vouchers: E. E. Leasure and E. J. Frick.
- SPANGLER, GEORGE W., D.V.M.
2021 Randolph, Topeka, Kan.
Vouchers: E. R. Frank and E. E. Leasure.
- SPENCER, RICHARD H., D.V.M.
Oakley, Kan.
Vouchers: E. E. Leasure and R. R. Dykstra.
- STEINMETZ, HYMAN, D.V.M.
49 Millet St., Dorchester 24, Mass.
Vouchers: E. E. Leasure and E. J. Frick.
- STUESER, RALPH H., D.V.M.
Richfield, Wis.
Vouchers: E. E. Leasure and E. R. Frank.

- SUTCLIFFE, JOHN W., D.V.M.
Rt. No. 5, Manhattan, Kan.
Vouchers: E. E. Leasure and R. R. Dykstra.
- SWARTZ, DONALD F., D.V.M.
Soldier, Kan.
Vouchers: E. E. Leasure and R. R. Dykstra.
- TAYLOR, KENNETH E., D.V.M.
Osborne, Kan.
Vouchers: E. E. Leasure and E. R. Frank.
- THEOBALD, WILLIAM, D.V.M.
Raub, N. Dak.
Vouchers: E. E. Leasure and R. R. Dykstra.
- TROTTER, DONALD M., D.V.M.
Dawson, Minn.
Vouchers: E. E. Leasure and E. R. Frank.
- VAN WALLEGHEN, ALBERT K., D.V.M.
Fisher Rd., Shawnee, Kan.
Vouchers: G. R. Moore and E. E. Leasure.
- WAITE, JOHN R., D.V.M.
Fenton, Iowa.
Vouchers: E. R. Frank and G. R. Moore.
- WALSTROM, VERYL A., D.V.M.
Spencer, Iowa.
Vouchers: J. W. Lumb and E. E. Leasure.
- WECHMAN, DEAN K., D.V.M.
Holton, Kan.
Vouchers: E. E. Leasure and E. J. Frick.
- WEINMAN, DONALD E., D.V.M.
2525 O St., Lincoln 8, Neb.
Vouchers: E. J. Frick and R. R. Dykstra.
- WEISETH, WERNER H., D.V.M.
Colman, S. Dak.
Vouchers: E. E. Leasure and E. R. Frank.
- WINCHESTER, WILLIAM J., D.V.M.
565 E. Garvey Blvd., El Monte, Calif.
Vouchers: E. E. Leasure and E. J. Frick.
- WOODBIDGE, JOHN P., D.V.M.
Huntsville, Ark.
Vouchers: E. E. Leasure and M. S. Cover.
- WOODS, GEORGE T., D.V.M.
Caney, Kan.
Vouchers: R. P. Link and E. E. Leasure.

U. S. GOVERNMENT

Publication of Yearbook Resumed.—Publication of the *Yearbook of Agriculture* is being resumed. Tentative plans of the U. S. Department of Agriculture call for having the first edition since 1942 ready by the end of this year, under the title, "Science and the Farmer."

Some of the subjects to be covered are: feeding, breeding and care of livestock in the light of newer knowledge; new facts on soils, fertilizers, and microorganisms; insects, insecticides, and fungicides; new farm machines and processing methods; plant culture, growth regulators, and new varieties of crops; irrigation and hydraulics; household developments, new food preparations, and new data on diets and home management.

Dr. H. C. McPhee will represent the Bureau

of Animal Industry on the committee planning the book.

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Brucellosis Vaccination.—More than 500,000 calves were officially vaccinated against brucellosis during the fiscal year 1945, the Bureau of Animal Industry reports. This number is an increase of about 28 per cent over that of the previous year.

AMONG THE STATES

Arizona

To Entertain the Fast Ones.—Plans for a half-mile track at Phoenix are in progress. The object is to induce racing stables to do their winter training in the Valley of the Sun in lieu of under less friendly skies of other climes.

British Columbia

Septic Sore Throat Traced to One Dairy.—The outbreak of septic sore throat in April, 1945, at Salmon Arm (pop. 900) as reported in the *Canadian Journal of Public Health* (Nov., 1945) was traced to one dairy, designated as "A" dairy in the report. From 85 to 90 per cent of the cases were found to have consumed milk supplied by that source. The epidemic involved 136 persons, including all persons on the farm engaged in handling the milk. An employee of the dairy had been ill with a severe sore throat some time previous to the epidemic and 1 cow had mastitis.

California

Funds Asked for Davis Project.—The Board of Regents of the University of California has submitted a request to the state legislature for \$1,670,000 to permit the construction and staffing of two veterinary science units at Davis. This would augment an allotment previously made for a similar unit there.

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Predatory Animal Control.—The California Wool Growers Association passed a resolution at the 1945 meeting in San Francisco urging a federal appropriation of not less than \$1,500,000 a year for the protection of "public health, domestic livestock and wildlife" against predatory animals.

• • •

Personal.—Dr. Frank W. Miller took charge of the Packers and Stockyards Division, USDA, at Los Angeles, in November, vice Frank G. Fitz-Roy, incumbent since 1943, who was transferred to Omaha.

Canada

Dr. Hall Gets New Post.—The appointment of Dr. Orlan Hall (Ont., '10), of Ottawa, to the position of chief veterinary inspector of the Health of Animals Division has been announced

by the Dominion Department of Agriculture. A staff member of the Department since 1912, he has been actively engaged in bringing bovine tuberculosis under control.

Connecticut

Federal Scientific Research Approved.—The Sheffield Scientific School of Yale, through its board of permanent officers, unanimously approved the report of the committee appointed to establish a policy as to the support of federal scientific research, the bases to be (1) freedom of research and choice of problems, (2) freedom of political control and choice of executives, (3) support of fundamental and theoretical investigations, and (4) restoration of personnel lost by the war through federally supported graduate fellowships and undergraduate scholarships.—*From Science.*

Illinois

State-County Disease Control Meeting.—State-employed veterinarians, county veterinarians, and disease control officials held an annual meeting at the Centennial building in Springfield, Jan. 15-16, 1946. The conference was under the direction of the state division of livestock industry.

Following an address of welcome by State Director of Agriculture Arnold P. Benson, the following program was presented:

Dr. C. E. Fidler, Division of Animal Industry, Springfield: Summary of Disease Control Activities in 1945.

Mr. Geo. A. Fox, Division of Livestock Industry, Springfield: New Laws and Regulations.

Mrs. E. Mockbee, Division of Livestock Industry, Springfield: Office Problems.

Drs. W. A. Walker, Golconda, and B. H. Gray, Will county: Combination TB and Brucellosis Testing—a Review.

Drs. E. J. Hart, R. H. Ralph, and W. A. Hahn: Lining up Work in the Field.

Drs. W. H. Dean and D. W. Pratt: Doctor Meets Farmer Prospect.

Dr. T. O. Alberts, University of Illinois, Urbana: Illinois Mastitis Control Program.

Dr. A. B. Crawford, Animal Disease Station, Beltsville, Md.: Nonlesion and Skin Tuberculosis Reactors.

Dr. A. K. Kuttler, U. S. Bureau of Animal Industry, Springfield: Completing the Job in the Infected Herd, and Preventing Reinfection. (Discussed by Dr. Paul D. Beamer, University of Illinois, Urbana.)

Dr. R. C. Klussendorf, AVMA, Chicago: Advantages and Limitations of Vaccination in a Postwar Brucellosis Control Program.

Dr. Asa Winters, State Bureau of Animal Industry, Albany, N. Y.: The New York Plan of Control of Brucellosis.

Sound pictures on "The Science of Milk Production" and "Avian Tuberculosis" also were shown during the meeting.

Dr. Raymond B. Allen, dean of the Chicago College of Medicine, University of Illinois, was the guest speaker at the annual banquet, held at the Elks Club in Springfield on the evening of January 16. His subject: Some Relations of Disease Control in Animals to Man and Society.

Pioneer Parasitologist Dies.—The death of Dr. Henry B. Ward recalls the influence he wielded on the growing public consciousness that neither we nor the fish need to put up with waste-polluted streams and lakes. He worked especially with the effects of these waste products on the fish.

Dr. Ward also worked toward the development of parasitology as a distinct discipline within the study of zoölogy, and he founded the American Society of Parasitologists. As Emeritus Professor of Zoölogy at the University of Illinois, he knew the need for bringing facts and interpretations of science home to the common man—and the technique for doing so.

Swine Brucellosis Control.—To clean up a herd infected with brucellosis is often a difficult problem. Here's how the University of Illinois has developed an abortion-free herd from a reacting foundation.

The pigs are farrowed in accordance with the McLean system of sanitation. Then, at weaning time or shortly after, those to be used for breeding are again moved to clean ground, away from their infected dams and the lots where they have run. These young, negative-testing animals are maintained as an abortion-free nucleus, tested regularly, and kept away from all possible sources of contamination. None but abortion-free animals are brought into this part of the herd, including subsequent clean-testing offspring of the infected dams. Finally, the reacting dams are retired in an orderly way when their period of herd usefulness is ended.

Chicago Association.—At the regular monthly meeting at the Palmer House, January 8, Dr. Joseph K. Narat, prominent Chicago surgeon, outlined "Modern Advances in Surgery"; the ladies met for their usual pastime, and the following officers were elected for the fiscal year: Dr. R. L. Trader, *president*; Dr. Matt J. Skala, *vice-president*; and Dr. Robert C. Glover, *secretary-treasurer*.

Where Butter Has Gone.—In October, 1945, says the National Dairy Council in Chicago, only 89 million pounds of factory-made butter were produced in the United States as compared with 100 million pounds in the same month of 1944, and over 136 million pounds in October of 1941. Even though milk production is at the highest level in history, the demands for milk, ice cream, and fluid cream,

all of which return a higher price to the farmer, are so high as to leave less milk for the manufacturing of butter than at any time in the past twenty-five years. Hence, the Council admonishes, the American people can't have their butterfat in other forms and have butter too.

Institute of American Poultry Industries.—Mr. Don M. Ogilvie has accepted a position as assistant to Dr. Cliff D. Carpenter, president of the institute. Mr. Ogilvie is a graduate of Purdue University, and has spent three and one-half years in the Navy as a lieutenant.

Illinois State Association.—The sixty-fourth annual meeting of the Illinois State Veterinary Medical Association was held at the Leland hotel, Springfield, Jan. 17-18, 1946, with Dr. J. V. Lacroix, of Evanston, presiding. Governor Dwight H. Green was the guest speaker.

Contributors and their subjects were:

Dr. C. E. Fidler, Division of Animal Industry, Springfield: Comments on Revision of the Rules and Regulations of the Division of Livestock Industry.

Dr. Robert Graham, University of Illinois, Urbana: The Illinois Program of Bovine Mastitis Control.

Dr. Betty J. Wright, Perry, Mich.: Dairy Cattle Practice.

Dr. E. E. Slatter, Danville: Livestock and Agricultural Conditions in China.

W. E. Krauss, Ph.D., Ohio Agricultural Experiment Station, Wooster: Supplementary Vitamins for Calves.

Dr. C. A. Lemen, Warrensburg: Penicillin in Veterinary Practice.

Dr. E. T. Anderson, Kewanee: Some Experiences in the Service in Europe.

Panel discussions on small animal practice, swine diseases, and diseases of dairy cattle were led, respectively, by Drs. S. W. Haigler, St. Louis, Mo.; W. D. Daugherty, Sterling; and R. C. Klussendorf, Chicago.

A movie on veterinary public relations was presented through the courtesy of the Associated Serum Producers.

Meanwhile, on January 17, the Women's Auxiliary held an equally eventful meeting—their fourth annual—following which they joined the men for a cocktail party, then a banquet and dance.

First State Veterinarian.—The first law in the United States creating the office of state veterinarian was passed by the state legislature in 1877-1878, and the first appointee was Dr. W. H. Paaren of Chicago, foremost among the veterinarians of his day. Men of great worth to the nation have occupied the office. Casewell, Trumbower, Wright, Dyson, and Peters were towering figures in the field of livestock sanitation. These were men of master

minds, who met force with force and won. Glanders, Texas fever quarantine, antemortem inspection to guard the farmers' interest, hog-cholera antiserum production to lead the way, and tuberculosis were all in the day's work. Tuberculosis? Why yes, don't you remember? Dyson's *accredited herd plan* was the starting point that made national bovine tuberculosis control popular and possible. If in the ups and downs of that important office the patterns cut by these old timers are cast aside, well, it's just too bad.

Indiana

State Association.—The sixty-second annual meeting of the Indiana Veterinary Medical Association was held at the Severin Hotel, Indianapolis, Jan. 9-11, 1946. After the address of President T. L. Steenerson and the reports of Secretary-Treasurer Henry A. Lidikay, State Veterinarian G. E. Botkin, and the various committees, the following technical program was carried out:

Dr. A. H. Quin, Kansas City, Mo.: An Evaluation of DDT in the Control of Ectoparasites.

Dr. S. E. Burney, Indiana State Board of Health: Indiana's Public Health Program.

Dr. H. E. Pinkerton, Fort Dodge, Ia.: Swine Diseases.

Dr. R. E. Lubbehusen, St. Louis, Mo.: Clinical Diagnosis of Some Nutritional Deficiencies.

Mr. Ed. Mason, WIBC, Indianapolis: WIBC's "R.F.D. 1070" Indiana Veterinarians Coöperating.

Dr. J. E. Ferrell, president, Indiana Medical Association, Fortville: An Address.

Dr. George H. Hopson, New York City: Use and Misuse of Milking Machines.

Dr. Wayne H. Riser, Des Moines, Ia.: The Relationship of the Herniated Intervertebral Disc to Posterior Paralysis in Dogs.

Dr. Carl F. Schlotthauer, Mayo Foundation, Rochester, Minn.: Some Causes of Fits and Convulsions in Dogs, and Penicillin in Veterinary Practice.

Dr. William G. Magrane, Mishawaka, Chairman: Panel Discussion of Small Animal Diseases by Dr. H. M. Bratt, Terre Haute; Dr. Wayne H. Riser, Des Moines, Ia.; Dr. C. C. Rife, Atlanta, Ga.; Dr. Carl F. Schlotthauer, Rochester, Minn.

Dr. S. L. Stewart, Olathe, Kan.: Brucellosis in Dairy Cattle as a Practitioner Finds It in Practice—Prevention and Control, and Symposium on Milk Fever.

Dr. George R. Fowler, Iowa State College, Ames: Equine Surgery (Film) and Surgical Principles and Bovine Surgery.

Dr. F. R. Beaudette, Agricultural Experiment Station, New Brunswick, N. J.: Poultry Diseases, and Turkey Diseases.

Mrs. Florence H. Stone, Indianapolis: Public Relations Program.

Dr. R. C. Klussendorf, Associate Editor, Amer-

ican Veterinary Medical Association, Chicago: Reproductive Problems, and Calf Raising.

Mr. Lewis E. Harris, Lincoln, Neb.: Practical Veterinary Diagnostic Methods. (Illustrated).

A luncheon and business meeting of the Ladies' Auxiliary was held January 10, Mrs. O. B. Curry, Morristown, presiding.

The following officers were elected: Drs. O. C. Shockley, New Ross, *president*; Geo. Clark, Columbia City, *vice-president*; Henry A. Lidl-kay, Darlington, *secretary-treasurer* (re-elected).

Iowa

Distinguished Alumnus Retires.—Dr. Clyde W. Warburton, head of the extension service of the USDA for seventeen years, 1923-40, was retired after forty years of government service.



—From Agricultural Leaders' Digest

Dr. C. W. Warburton (left), longtime head of the USDA extension service, honored by his fellow workers.

His wartime assignment was that of governor of the Farm Credit Administration. Dr. Warburton was born at Independence and is an alumnus of Iowa State College. At a special program held in his honor by his fellow workers in the Agricultural Building, he was presented with a token—a luxurious wallet stuffed with folding money. Date of the ceremony is not given.

Kansas

Refresher Course at Kansas State College

—The School of Veterinary Medicine will offer a four-weeks refresher course beginning March 4 and terminating March 30, 1946. Enrollment will be limited to not more than 50 veterinarians who must be graduates of schools accredited by the AVMA. Enrollment will be by "petition" and upon approval a "permit" will be issued. Veterans will be given priority. If less than 15 qualified persons apply, the course will not be offered.

The charge is \$25.00 for the four-weeks session or any part thereof. Veterans of World War II, if otherwise eligible under Public Law 346, may enroll under the provisions of that act.

The college assumes no responsibility for

rooming or boarding accommodations, but will assist to the extent of its ability. Housing accommodations for married couples are practically impossible to secure.

The course will be repeated if there is sufficient demand for it. For full details, interested persons should communicate at once with the dean of the School of Veterinary Medicine, Kansas State College, Manhattan.

s/R. R. DYKSTRA, *Dean*.

Fourth District.—Dr. and Mrs. Leroy Dietrich were hosts to the veterinarians of the fourth district on Dec. 8, 1945.

Dr. G. R. Moore, Manhattan, discussed "Handling Sterility Problems in Practice"; the paper called forth a lively discussion among the practitioners present.

Louisiana

Louisiana State University Short Course.

The fifteenth annual short course conducted for the Louisiana Veterinary Medical Association by the University and A. & M. College was held Jan. 16-17, 1946, at Dalrymple Memorial—Campus, Baton Rouge. The Technical program lists the following contributions:

Dr. W. M. Coffee: A Day of Practice (Large Animals), and Swine Diseases.

Dr. W. J. Gray: Bacillary Hemoglobinuria.

Dr. B. T. Simms: The U.S. Bureau of Animal Industry.

Dr. C. E. Bild: Short Cuts in Clinical Routines, and Therapy of Skin Troubles.

Mr. C. E. Smith: DDT—Its Use on Animals.

The motion pictures, *Sentinels in Milk*, prepared by the Division of Veterinary Science, Michigan State College; *How Cows Make Milk*, a Purina Mills film; and a public relations film of the Associated Serum Producers, Inc., were shown. Dr. B. T. Simms discussed the films, *Coccidiosis of Calves*, and *Plant Poisoning—Dallis Grass, Winter Peas and Sweet Potatoes*.

Drs. C. M. Heflin, J. A. Goodwin, and F. J. Douglass, Sr., managed the question box.

Dean J. G. Lee, Jr., College of Agriculture, and Chief B. T. Simms, U. S. Bureau of Animal Industry, were the speakers at the banquet. Dr. A. V. Young officiating. On the list of "Who's Who" was W. (Bill) T. Oglesby, head of the Department of Veterinary Science, just back from a long stretch in the Army.

Missouri

Kansas City Association.—"Cattle Practice Problems" by Dr. W. L. Boyd, University Farm, St. Paul, Minn., featured the regular meeting of the Kansas City Veterinary Medical Association, held at the Continental Hotel, Dec. 18, 1945. Dr. W. L. Jones, of Blackburn, led the discussion.

s/GAIL B. SMITH, *Secretary*.

Nevada

Gift for Cancer Research.—Dr. Theodore L. Chase, of Reno, retired Philadelphia surgeon, has donated \$450,000 to Temple University, Philadelphia, to establish a foundation for surgical research with special reference to cancer. The gift was made in memory of his wife, the late Dr. Agnes Barr Chase.

New York

New Scientific Publication.—*Blood—The Journal of Hematology* is the name of a new scientific magazine. The editorial offices are in Boston, and the business affairs and printing are in the hands of Grune and Stratton, 381 Fourth Avenue, New York City. The editor-in-chief is Dr. William Dameshek, 25 Bennett Street, Boston. A large staff of foreign and domestic associate editors and contributing editors has been organized to guide its policy. The publication will be devoted exclusively to blood and blood-producing organs, units of knowledge which now stand apart in clinical practice. Publication will be bimonthly, subscription price \$6.00.

New York City Association.—At the regular meeting held on Jan. 2, 1946, at the Hotel Pennsylvania, the members listened to Dr. Charles E. Fletcher discuss "Ear Cropping in Various Breeds of Dogs."

S/C. R. SCHROEDER, Secretary.

Cornell Conference.—New York State Veterinary College at Cornell University held its thirty-eighth annual conference for veterinarians Jan. 9-11, 1946, in Ithaca.

Motion pictures on medical topics opened the program on each of the three days. The following papers were presented:

Dr. F. R. Beaudette, New Jersey Agricultural Experiment Station, New Brunswick: Newcastle Disease, discussed by Dr. P. P. Levine, Cornell University, Ithaca.

Dr. E. C. Showacre, M.D., Cornell University: X-Ray Hazards.

Dr. C. L. Blakely, Angell Memorial Animal Hospital, Boston, Mass.: Diaphragmatic Hernias.

Dr. E. P. Leonard, Summit, N. J.: Treatment of Fractures.

Drs. J. H. Whitlock and D. W. Baker, Cornell University: The Diagnosis of Diseases of Lambs.

Dr. J. H. Whitlock: The Administration of Drugs to Sheep (Illustrated).

Drs. D. W. Baker, Cornell University, and I. G. Howe, State Bureau of Animal Industry, Albany: The Diagnosis and Control of Cattle Mange.

Capt. R. S. Taggart, Sn C, AUS, Utica: DDT. Discussed by Dr. H. H. Schwardt, Cornell University.

Dr. H. H. Dukes, Cornell University: Physiology of the Ruminant Stomach (Illustrated).

Dr. F. A. Mettler, M.D., Columbia University, New York City: Some Neurologic Derangements of Animals.

Dr. F. B. Hutt, Cornell University: Some Hereditary Abnormalities of Domestic Animals.

Dr. D. H. Udall, Cornell University: Calf Diseases.

Dr. J. A. Henderson, University of Illinois, Urbana, Ill.: Developments in Artificial Insemination.

Drs. S. D. Johnson and M. G. Fincher, Cornell University: Treatment of Mastitis with Penicillin.

Dr. W. R. Krill, Ohio State University, Columbus, Ohio: Some Phases of Dairy Cattle Practice.

Panel discussions on rabies and dairy cattle practice were led by Dr. A. Zeissig, Department of Health, Albany, and A. G. Danks, Cornell University, respectively.

A dinner was held in the Memorial Room of Willard Straight Hall on January 10. Speakers of the evening were Dr. K. L. Turk, Cornell University, who presented "Some Recent Advances in Animal Husbandry," and Dr. W. A. Hagan, dean of the New York State Veterinary College, who spoke on "Military Government in Germany."

Dr. Stader on Television.—Dr. Otto Stader (U.P., '18), of Admore, Pa., will appear on a television broadcast in New York City, Feb. 7, 1946.

Southern Tier Association.—At the annual winter meeting of the Southern Tier Veterinary Medical Association, held in Elmira, N. Y., Jan. 3, 1946, the following resolution was adopted by unanimous vote:

WHEREAS, medical and veterinary research with animals has contributed to the saving and prolongation of human life, the saving and protection of our animal population, and the prevention and alleviation of suffering both in man and animals; and

WHEREAS, the dog is the indispensable animal for much research, such as that which led directly to the discovery of insulin for diabetes, liver treatment for pernicious anemia, and niacin treatment for blacktongue in dogs; and

WHEREAS, the prohibiting of the use of dogs in such research work would seriously obstruct the future progress of medicine, human and veterinary, in the conquering of the remaining scourges of mankind and our animal populations, and

WHEREAS, many lives have been saved in the present war primarily by animal research through work on blood plasma and various drugs; and

WHEREAS, the benefits to mankind and

the animal kingdom have been great through such research in surgery and medicine, particularly that related to rickets, high blood pressure, lockjaw, hookworm, rabies, diphtheria, diabetes and distemper; and

WHEREAS, there has been a studied attempt by various groups to prevent further research work on animals, especially dogs, therefore be it

RESOLVED, that the Southern Tier Veterinary Medical Association strongly endorses the principle of research on dogs and other animals as a necessary aid to human and animal welfare and to public health;

AND, be it also resolved that the Southern Tier Veterinary Medical Association endorses the aims and purposes of the "Friends of Medical Research," an organization founded for the purpose of aiding, furthering, and protecting such researches.

S/DONALD W. BAKER, *Secretary*.

North Carolina

Artificial Breeding.—The illustrated article on artificial breeding of dairy cows by Dr. E. L. Shuford, general practitioner of Asheville (*North Am. Vet.*, 27, Jan. 1946: 17-21), again turns attention to opportunities slipping gradually into the hands of nonveterinary technicians, unnecessarily.

North Dakota

State Association.—The forty-first annual meeting of the North Dakota Veterinary Medical Association was convened at Town Hall, Fargo, for a two-day meeting Jan. 14, 1946. Outstanding features of the program were:

Dr. W. L. Boyd, University Farm, St. Paul, Minn.: Feeds and Feeding from the Standpoint of the Veterinarian, and Brucellosis and Its Relation to Vaccination.

Dr. L. M. Roderick, Kansas State College: Some Epizootiological Observations.

Dr. B. J. Gray, Fort Dodge, Ia.: Swine Diseases.

Mr. J. E. Pyle, manager of Armour and Company, Fargo, made an address at the banquet presided over by State Veterinarian Dr. T. O. Brandenburg.

The retiring officers were Dr. C. L. Johnson, Harvey, *president*; Dr. G. J. Worner, Bismarck, *vice-president*; and Dr. J. O. Foss, Fargo, *secretary-treasurer*.

Ohio

Dr. Fogle Speaks over WLW.—Dr. C. W. Fogle (Ont., '07), of Leipsic, was guest speaker on the "Keep 'em Healthy Series" of Everybody's Farm Hour, broadcast over station WLW on Saturday, Jan. 12, 1946. His subject was "Thumps in Pigs."

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State Association.—The sixty-second annual

meeting of the Ohio Veterinary Medical Association met at Columbus, Jan. 2-4, 1946. More veterinarians registered for this meeting than for any previous one.

The literary program included the following out of state speakers:

Dr. Otto Stader, Ardmore, Pa.: The Management of Fractures in Small Animals.

Dr. Gerry B. Schnelle, The Angell Memorial Hospital, Boston: Radiology in Small Animals.

Dr. R. C. Klussendorf, AVMA office, Chicago: Calf Raising.

Dr. E. M. Baldwin, Corn States Serum Company: Etiological Studies of Bovine Infectious Keratitis.

There was a panel discussion on swine diseases, one on poultry diseases, and another on general practice. The members of the panel on swine diseases were: Dr. F. A. Zimmer, Corn States Serum Company, chairman; Dr. B. H. Edgington, Ohio Agricultural Experiment Station; Dr. J. A. McCoy, Washington C. H.; Dr. George Lies, Fort Recovery; and Dr. W. L. Robinson, Ohio Agricultural Experiment Station.

The members of the panel on poultry diseases were: Dr. Elmer Augsburg, BAI, Lima; and Dr. E. S. Weisner, Goshen, Ind.

All of the members who had previously appeared on the program took part in the panel discussion on general practice, with Dr. Walter R. Krill acting as chairman. Dr. Carl Gay acted as toastmaster at the banquet, reported to be the most successful in many years.

Officers elected for 1946 were: Dr. J. H. Lentestey, Lyons, *president*; Dr. A. G. Madden, Madeira, *president-elect*; Dr. George Lies, Fort Recovery, *vice-president*; Dr. F. J. Kingma, Columbus, *secretary*; while Dr. W. R. Hobbs, Columbus, was reelected *treasurer*. Dr. R. E. Rebrassier, who had served as secretary for twenty years, was presented with a token of appreciation when he insisted upon retiring from the office.

Ontario

Shropshire Breeder Retires.—The retirement of John Miller, of Claremont, noted breeder of Shropshires, was announced with regret by the active promoters of the breed. The Miller farm, established in 1872, has furnished many imported rams to American flocks. Mr. Miller belongs to the group of notable sheepmen whose enterprise did so much to improve the sheep flocks of North America. His son, Hugh J. Miller of the third generation, will carry on. The debt owed to the far-seeing pioneers who kept livestock breeds from deteriorating is acknowledged in the veterinary circle.

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Health Units Formed.—Eight full-time health units to be operated under the Provincial Department of Health have been organized. These units are comparable to the county health de-

partments being rapidly organized under state laws in the United States. Since this pattern of public health work includes milk and meat sanitation, increasing demand for veterinary service on a full-time or part-time basis is predictable.

Pennsylvania

Northwestern Pennsylvania Veterinary Club.—The members met on January 15, with Dr. S. C. Kinton, Warren, to hear Dr. H. C. Kutz, Harrisburg, who is president of the State Veterinary Medical Association. Dr. Wm. C. G. Savage reported on the annual conference held at Philadelphia on January 8 and 9. Dr. H. M. Mershon, Linesville, is president of the club.

s/P. L. ROUSE, *Secretary.*

Pennsylvania Conference.—"America is the safest place in the world to raise livestock—and babies. The influence of the veterinarian is important in both instances." So spoke Dr. George A. Dick, dean of the School of Veterinary Medicine, University of Pennsylvania, in his address of welcome before the school's forty-sixth annual conference for veterinarians, held in Philadelphia on Jan. 8-9, 1946.

The literary program included the following:

Dr. W. L. Boyd, University of Minnesota, St. Paul: Infertility of Domestic Animals.

Dr. R. C. Klussendorf, AVMA, Chicago: Ketosis.

Dr. E. L. Stubbs, University of Pennsylvania, Philadelphia: The Diagnosis of Newcastle Disease and Epidemic Tremor (Illustrated).

Dr. C. P. Bishop, Pennsylvania Bureau of Animal Industry, Harrisburg: Importance of Preventive Measures in Animal Diseases.

John C. Lotze, U. S. Department of Agriculture, Beltsville, Md.: The Diagnosis and Treatment of Anaplasmosis.

Dr. Edwin A. Churchill, University of Pennsylvania, Philadelphia: Abdominal Surgery in the Horse.

Dr. E. F. Schroeder, Angell Memorial Animal Hospital, Boston: Fractures (Illustrated).

Dr. R. C. Klussendorf, AVMA, Chicago: Calf Raising.

Drs. I. Live, F. G. Sperling, and E. L. Stubbs, University of Pennsylvania, Philadelphia: Streptomycin in Experimental Brucellosis of Guinea Pigs.

Dr. Edwin A. Churchill, University of Pennsylvania, Philadelphia: Demonstration and Discussion of an Electronic Foreign Body Locator.

Dr. H. C. Kutz, Pennsylvania Bureau of Animal Industry, Harrisburg: The Diagnosis of Tuberculosis.

Dr. James H. Steele, U. S. Public Health Service: The Veterinarian in Public Health Work.

E. P. Laug, Food and Drug Administration, Washington, D. C.: DDT.

Another contribution to the two-day session was a motion picture on veterinary public relations, shown through the courtesy of the Associated Serum Producers.

A conference dinner sponsored by the Veterinary Alumni Society of the University was held on the evening of January 8.

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Dr. Dick Retires as Dean.—The University of Pennsylvania announced on January 7 the retirement of Dr. George A. Dick as dean of the School of Veterinary Medicine, a post which



Dr. George A. Dick

he had held for fourteen years. He has been succeeded by Brig. General Raymond A. Kelser as announced in the January JOURNAL.

Dr. Dick, who became dean of the faculty in 1931, will continue as professor of animal industry to which position he was appointed in 1920. He had asked to be relieved of the deanship in order to devote his full efforts to the development of his teaching field at the school. He will also continue as director of Bolton Farm near Fallsington where research in animal pathology is conducted.

At a dinner on the night of January 8, sponsored by the Veterinary Alumni Society during the recent conference of veterinarians, Dr. Dick was presented with a gold watch from faculty and alumni friends in appreciation of his splendid services to the school.

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Personal.—Dr. Palace H. Seitz has resigned his position as principal poultry pathologist in the Pennsylvania Bureau of Animal Industry, where he served for fifteen years, to accept the position of general manager for the York Valley Poultry Farms, Wrightsville.

Foreign

Australia

Caponizing Wormy Cockerels.—An article by M. W. Aird, poultry adviser, published in the September (1945) issue of the *Journal of the Department of Agriculture of South Australia* is illustrated with excellent pictures credited to bulletins of the agricultural experiment stations of Iowa and Kansas. The author describes the operation in all essential details in respect to preparation, instruments, technique, aftercare, age of operatees, and economic advantages. Worthy of stressing is the author's warning against caponizing cockerels heavily infected with roundworms.

Saipan

Bench Show of the K-9 Corps.—*Dog World* for October, 1945, carries a news item giving a short account of a dog show held in August on this now historic island. Mary Brian, screen star, awarded the trophies. The judges were Al Pearce, of the radio, and Charles Ruggles, of the movies. Four of the entries were war dogs that participated in the landing operations of June 15, 1944. Honors for the "best in the show" went to a Dachshund belonging to a medical officer of the Navy, Lieut. Lyman R. Fisher, of Ithaca, N. Y.

COMING MEETINGS

Kentucky Veterinary Medical Association. Kentucky Agricultural Experiment Station, Lexington, Ky., Jan. 31, and Feb. 1-2, 1946. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary-treasurer.

Wisconsin Veterinary Medical Association. Park Hotel, Madison, Wis., Jan. 30-31, and Feb. 1, 1946. B. A. Beach, University of Wisconsin, Madison 6, Wis., secretary.

Connecticut Veterinary Medical Association. Bond Hotel, Hartford, Conn., Feb. 6, 1946. G. E. Corwin, 36 Capitol Ave., Hartford 6, Conn.

South Dakota Veterinary Medical Association. Sioux Falls, S. Dak., Feb. 6-7, 1946. J. T. McGilvray, R. R. No. 3, Sioux Falls, S. Dak., secretary.

Veterinary Medical Association of New Jersey. Hotel Hildebrecht, Trenton, N. J., Feb. 7-8, 1946. J. R. Porteus, Box 938, Trenton 5, N. J., secretary.

Alabama Polytechnic Institute. Annual Short Course for Veterinarians. Auburn, Ala., Feb. 26-28, 1946. E. S. Winters, College of Veterinary Medicine, administrative secretary.

American Society of Parasitologists.

Municipal Auditorium, St. Louis, Mo., March 28-30, 1946. James T. Culbertson, secretary.

American Animal Hospital Association.

Hotel Pennsylvania, New York, N. Y., April 16-18, 1946. R. E. Ruggles, P. O. Box 303, Moline, Ill., secretary.

BIRTHS

To Dr. and Mrs. Sam Perlman, 1519 Petersburg Pike, Richmond 24, Va., a daughter, Sue Roberta, April 16, 1945.

To Dr. (O.S.U., '44) and Mrs. M. S. Phillips, 1692 Clifton Ave., Columbus, Ohio, a daughter, Carol Ann, Nov. 2, 1945.

To Dr. (Colo., '43) and Mrs. J. H. McNamara, 110 Broadway, Versailles, Ky., a son, John Thomas, Nov. 12, 1945.

To Dr. (M.S.C., '44) and Mrs. Robert J. Flynn, Box 647, Ashton, Ill., a daughter, Jean Barbara, Dec. 6, 1945.

To Dr. (Tex., '41) and Mrs. H. Reed Faust, Box 3, Comfort, Texas, a son, Larry Reed, Oct. 19, 1945.

To Lt. (Colo., '43) and Mrs. Bryant B. Nisley, 1110 Gunnison Ave., Grand Junction, Colo., a daughter, Kay Lynn, Nov. 27, 1945.

To Dr. (A.P.I., '42) and Mrs. T. C. Deal, Burghaw, N. Car., a daughter, Nancy Jo, Nov. 29, 1945.

To Dr. (Wash., '44) and Mrs. Donald H. Mustard, P. O. Box 943, Satsop, Wash., a daughter, Janet Louise, Dec. 15, 1945.

To Dr. (O.S.U., '42) and Mrs. R. F. Baker, 119 N. Pearl, Spencerville, Ohio, a daughter, Ellen Kay, Dec. 17, 1945.

To Dr. (K.S.C., '41) and Mrs. D. O. Manley, 501 N. Norton Ave., Norton, Kan., a son, John Henry, Dec. 28, 1945.

DEATHS

Fred R. Ahlers (I. S. C., '02), 63, Lamotte, Ia., died Sept. 30, 1945. Dr. Ahlers was a native of Iowa and had practiced his profession in the Lamotte area for some forty-three years. He was admitted to the AVMA in 1904.

Harry B. Cox (Amer., '95), 74, Barrington, N. J., died Jan. 4, 1946. Dr. Cox had served for many years on the Pennsylvania State Board of Veterinary Examiners.

John J. Hayes (N. Y. Amer., '00), 64, Chicago, died Oct. 22, 1945. Dr. Hayes retired from the Meat Inspection Division of the BAI on March 15, 1945, after an association of over twenty years.

Mack P. Rice (C. V. C., '17), 53, Wilton, Wis., died recently. Dr. Rice was a native of Wilton county and was well known throughout that area, where he carried on an extensive practice.

Edward T. Ryan (U. P., '08), Brookline, Mass., died Jan. 6, 1946. Dr. Ryan had been a member of the AVMA since 1912.

THE VETERINARY PROFESSION AND THE WAR

Colonel McCallam Named Chief of Army Veterinary Corps

The Office of the Surgeon General announced on Jan. 10, 1946, the appointment of Colonel James A. McCallam as director of the Veterinary Division, effective that date. He succeeds Brig. Gen. R. A. Kelser whose retirement was announced last month.

Colonel McCallam received his degree in veterinary medicine from the University of Pennsylvania in 1917. He was appointed veterinarian in the Regular Army on July 16, 1917, and served through various grades, being promoted to the grade of Colonel, Regular Army, on August 3, 1943, after having received temporary promotion to that grade on Feb. 22, 1943.

A graduate of the Army Veterinary School in 1924 and an honor graduate of the Medical Field Service School in 1925, Colonel McCallam's record of service includes assignment as division veterinarian in Hawaii; Headquarters veterinarian of the Remount Purchasing and Breeding Hdqrs., Central Remount Zone; instructor and officer in charge, Medical Department Reserve, Kansas City, Mo.; instructor at the Engineer School, Ft. Belvoir, Va.; instructor in the Department of Animal Transport, Field Artillery School, Fort Sill, Okla.; Corps Area veterinarian, 8th Corps Area; and army veterinarian, Sixth Army Hdqrs.

Colonel McCallam served overseas with the Sixth Army in Australia, New Guinea, and in Leyte and Luzon in the Philippines, and finally with the occupation forces in Japan before returning to this country for his present assignment.

New Veterinary Branch Added to Army Air Forces Headquarters

A new subdivision, the Veterinary Branch, has recently been added to The Air Surgeon's Office, Washington, D. C., according to a recent announcement. Lt. Col. Benjamin D. Blood, V.C., has been assigned to that office and thus becomes the first Chief Veterinarian of the Army Air Forces.

The functions of the AAF veterinarian include formulating veterinary policies, exercising

professional and technical supervision over veterinary personnel of the Air Forces, and coordinating AAF veterinary matters with civilian and other veterinary agencies.

Colonel Blood, a graduate of Colorado State College, class of 1939, returned to this country in August, 1945, after serving thirty-nine months in England and Europe as chief of the Air Forces Veterinary Service, European theater of operations.

Veterinary Corps Paid a Tribute

Hon. James I. Dolliver, of Iowa, read into the Congressional Record on Sept. 24, 1945, a tribute to the Veterinary Corps officers and personnel, as follows:

Buyers of meat were allowed to buy only from firms licensed by, and operated under, the supervision of the Meat Inspection Division of the Department of Agriculture. No meat or meat products were accepted without a certificate of inspection from the Veterinary Department of the Army Medical Corps. Orders specified the type, class, and grade of each article and, in most cases, the way in which it must be packed.

There were nearly 2,500 inspectors checking the orders for quality. While they were not an administrative part of the market center organization, obviously no safe and sound Government food buying job could have been done without them. In the plant of every meat packer, fish processor, egg packer, poultry processor, and cheese manufacturer or milk processor, inspectors checked on the sanitary conditions, the actual conditions of the product being prepared for Army consumption, and the proper packing and refrigeration, before shipment. They inspected at destination or shipside and at 30-day intervals in storage.

Colonel Worthington Returns

Col. J. W. Worthington (K.S.C., '17) has been returned to the United States after three and one-half years of internment in a dozen different Japanese prison camps. Early in the war he was listed as missing and probably deceased.

Veterinary Alumni News of Kansas State College quotes the Colonel as saying that he is "none the worse for wear though feeling as if I am Rip Van Winkle II."

Awards and Citations

Colonel Joseph F. Crosby (Corn. '15), assistant director of the Veterinary Division, Office of the Surgeon General, Washington, D. C., has received the Legion of Merit. The citation credits him with performing "an important part in the selection of veterinarians for initial commission in the Corps and his splendid judgment and ability in arranging for the assignment of the right personnel in the right places was an important factor in building up the highly efficient group of officers which constituted the war time Veterinary Corps."

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Colonel James E. Noonan (Ont. '11) has been awarded the Legion of Merit for outstanding service in Italy. The citation reads (in part): "As Veterinary Consultant to the Surgeon, Mediterranean Theater of Operations, Colonel Noonan instituted improved methods of storage, inspection, and reclamation of food supplies, which resulted in the economy of transport and labor as well as the better preservation of the health of the command."

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Major Everett B. Miller (U. P., '40) was recently awarded the Bronze Star Medal "for meritorious service in connection with military operations against an enemy of the United States."

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Maj. Gen. Norman T. Kirk, Surgeon General of the Army, has been awarded the Distinguished Service Medal in recognition of outstanding leadership in directing the largest medical department in the Army's history.

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Col. Jesse D. Derrick (U.P., '16) was recently awarded the Legion of Merit in recognition of his services as veterinarian of the First Service Command. The citation accompanying the award points out (in part) that he "distinguished himself by reorganizing the Veterinary Service and adapting it to the rapidly expanding needs of the Food Procurement Program. . . . Through broad understanding of producers' problems and superb tactfulness in the solution of problems, Colonel Derrick materially aided in the progress of the war effort at inestimable savings to the Government."

Veterinary Officers Separated from Military Service

Alabama
Fitzgerald,
Theodore C.
Green, James E.
Marston, Edward D.

Arizona
Lassen, Keith O.
McQuown, Paul F.

Arkansas
Brooks, Willard C.
Ivey, William E.
Labahn, Charles D.
Omohundro,
Richard E.

California
Burris, W. M.
Carroll, H. F., Jr.
Evans, Milton R.
Gidley, Joseph L.
Gsell, Preston L.
Harrison, Joseph W.
Henig, Harold F.
Ketchersid, James R.
Thom, Myron A.
Twisselmann, N. M.
Whitehead,
Charles J.

Colorado
Brown, Homer B.
Cowen, Russell L.
Davis, Charles L.
Head, Leland E.
Johnson, Harry W.
Leadbeater, W. A.
Smith, John W.
Stewart, Russel J.
Watson, George R.

Connecticut
Cockburn,
Kenneth A.
McIntosh, John P.
Winn, John D.

Florida
McCreary, Andrew J.
Mathews, Elmer L.

Georgia
Exley, Eldred W.
Mood, Bernard F.
Murphy, James T.

Illinois
Cyrog, Robert John
Kenzy, Sam George
Livingstone, John M.
McGinnis, Clifford L.
Ott, Herbert I.
Poppenhouse, G. C.

Tamoglia,
Thomas W.
Watson, Ralph C.

Indiana
Gorman, Harry A.
Wann, Raymond W.
Welbourn,
William E.

Iowa
Carey, John W.
Deaver, John W.
Eakin, Carol E.
Feldman, Louis W.
Fry, Lloyd Vern
Hibbs, Leonard W.
Lightbody, Hugh M.
Loucks, Joseph L.
Monlux, William S.
Niffenegger, Dean L.
Preusser, Karl R.
Savage, Robert E.
Smith, Philip E.
Thiele, Mervin I.
Thomson, Vale U.
Venzke, Walter G.
Wardall, Murray N.

Kansas
Caspar, Francis A.
Coddington,
Alton M.
Gale, Mark E.
Gory, Peter E.
Haley, John S.
Jordan, Frank W.
Kanawyer, W. L.
Leasure, Thomas J.
Nelson, Walbert O.
Palen, Joseph S.
Poppenhouse, C. A.
Remsberg, Glen S.
Spong, Laurence E.
Storz, Fred
Watson, James H.

Kentucky
Gilmore, Don F.
Glass, Sherman A.
Nolan, Alfred F.
Treat, Lester A.

Louisiana
Hesse, Charles P.
Hughes, Lynn B.

Maryland
Chadwick, Vernon D.
Conroy, James G.
Tolley, Robert

Massachusetts
Cameron, Bertram N.

Groves, Lawrence W.
Morkis, Edward S.
Schofield, Richard C.

Michigan

Loomis, Ladd N.
Stoner, Norman H.

Minnesota

Dovre, Odin
Evans, David E.
Mouw, John E. B.
Spangler, Don H.

Missouri

Glover, Albert D.
Lash, Cleo L.
Sarason, Jay J.

New Hampshire

Goldsmith,
Charles A.

New Jersey

Lohmeyer, Carl
Lustig, Seymour
Tierney, William F.

New Mexico

Schroer, John W.

New York

Angstrom,
Clement I.
Herman, Samuel E.
Kelsey, Richard C.
Miller, John W.
Stanton, Louis E.
Wilder, Clifford W.
Wood, Donald A.

Nebraska

Brillhart, Carl E.
Cady, Duane LeRoy
Gates, Morse A.
Gould, Kenneth M.
Kester, Howard L.
Miller, Clement L.
Peck, Eugene Way
Reppert, Ray Fred
Schneider, Morris D.
Steele, Merrill L.

North Carolina

Gregg, Merwin J.
Schoolley, Maurice A.

North Dakota

Matter, Anthony J.

Ohio

Abraham, Max Carl
Alvanos, Costas S.
Barner, Ralph D.
Brandon, Glen C.
Durigg, John R.
Fox, Charles W.

Friderici, W. J.
Gross, Irwin
Herd, Dwight G.
Holmes, John M.
Hook, Crosby J.
Ishee, Vaughn E.
Jones, Lowell M.
Kantzer, John F.
Muntz, Karl H.
O'Neill, John L.
Putnam, John L.
Sims, Jacob Barr
Smith, Robert M.
Sollomi, Phillip

Anthony

Sprunger, Earl M.
Terrill, Lloyd H.
Tuttle, Martin L.
Wickham, John J.

Oklahoma

Bergsten, Marcus L.
Denton, John P.
Hemphill, John G.,
Jr.
Hodgson, Melvin E.
Vierling, Clarence C.

Oregon

Coons, Max C.
Harris, Earl M.
Heller, Oliver P.
Howarth, Carl R.
Storey, Ensly R.

Pennsylvania

Abell, Leonard J.
Buckley, Howard P.
Carlson, Vance A.
Frank, Harry
Haverstick, D.
Jacobson, Otho H.
Krawitz, Leonard
Kriesel, Henry K.
Michael, Sidney J.
Rochfort, Robert F.
Rovner, Bernard B.
Tubis, Philip S.

South Carolina

Brown, Thomas E.
Young, Leonard E.

South Dakota

Swick, Calvin A.

Tennessee

Alford, Simon W.
Sadow, Irving J.

Texas

Anderson, Dan J.
Bate, Louis B.
Faust, Herbert R.
Levy, Abe
Miller, Arthur A.

Walker, Asa L.

Virginia

Eggert,
William E. Jr.
Kress, Joseph David

Washington

Bloomquist, E. W.
Conner, Roy Earl

Manly, Philip C.

West Virginia

Bailey, Lucien P.

Wisconsin

Burch, Clark W.
Collins, Charles G.
Stauch, Donald M.

Veterinary Biological Products

During the year which ended in June, 1945, veterinary officials of the Bureau of Animal Industry, Division of Virus-Serum Control, supervised the production of enough anti-hog-cholera serum to immunize more than 50 million pigs. This was the largest single item, but other serums, bacterins, viruses, toxoids, antitoxins, agglutinins, and diagnostic products were also supervised during production by veterinarians of this division, of which Dr. D. I. Skidmore is director.

A practitioner of no ordinary distinction in the Chicago milk shed, when asked merits of intra-udder treatment for mastitis, remarked: "I don't know, the herdsmen do the work themselves and I never asked them."

The mosquito is man's most formidable enemy. It causes more infectious illness than all other etiological factors combined and is the most baffling. Medical historians attribute the fall of Rome to the strength-sapping action of mosquitoes.

When Alfred Nobel, some fifty years ago, invented dynamite and smokeless powder, he predicted that peace on earth would forever be assured. Then came TNT, the V-rockets, and the atomic bomb, plus the largest armed forces the world has ever known—and a lot of wishful thinking.—*From Science.*

In general, the transformation of milk into cheese is the fermentation of lactose into lactic acid and of casein into simple amino acids, through the action of streptococci and lactobacilli. Enzymes produced continue the degradation for weeks and months and determine the flavor. Dairy chemists are not in agreement as to the ultimate effect pasteurization has on these delicate, secondary chemical processes.

GOOD RABIES VACCINE

While disinterested research and extensive field use have shown high potency for Lockhart rabies vaccine for many years, it is constantly being improved. Our present vaccine exceeds a hundred fold the requirements under the Habel (mouse) test. In test mice it confers almost perfect protection, even when challenged by massive doses of virus injected directly into the brain.

Lockhart Rabies Vaccine is a smooth, non-irritating suspension, easily administered through small needles. It is made for the discriminating veterinarian who wants his clientele to have the advantage of the best possible product.

Production facilities in our laboratories are adequate to ensure that supplies are available either direct or from reputable jobbers throughout the United States.

Metal tag and vaccination certificate are supplied with each dose of vaccine. Special certificate and metal tags bearing the veterinarian's name are furnished at nominal cost when veterinarians desiring them contract for an amount of vaccine corresponding to the number of special tags desired.

LOCKHART RABIES VACCINE IS SOLD ONLY TO GRADUATE VETERINARIANS, AND IS NOT SOLD AT A DISCOUNT TO ANY CITY, COUNTY OR STATE GOVERNMENTAL AGENCY.

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Often the Factor that means LIFE or DEATH!



Jen-Sal **NORMAL CANINE SERUM**

Liberal administration of this serum—derived from the defibrinated and filtered blood plasma of healthy, distemper-immune dogs—has countless and valuable daily uses in small animal practice.* Thus, it is primely indicated in shock, hemorrhage, dehydration, hypoproteinemia, for pre- or post-operative support, in organic debility, or wherever the replacement and stimulant values of homologous blood serum are in order.

Always sterile and ready for instant use by all parenteral channels of injection.

Supplied in Vials 100 cc. (Code: Saffron) \$1.80
(Less Usual Discounts)

* Levinson (J. Am. Med. A. 114, 455) cites that normal serum will overcome all the effects of hemorrhage in dogs except loss of red cells and that loss of erythrocytes may be quite extensive without serious effects.

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